where $F_o = F_o(t)$ is the modulating communication, $F_{oi} = F_o(t + \tau_i)$ and $\delta_i = \omega\tau_i$. [Abstracter's note: no reference is made in this article as to the meaning of M]. Assuming that τ_i is sufficiently small and that $F_{oi} \approx F_o$, expression (29) may be written as follows:

$$\Delta F_{AM} \approx 2\left(F_0 + \frac{1}{M}\right)\frac{\sum_{i=1}^{n}\sum_{j=i+1}^{n}\kappa_i\kappa_j\sin^2\left(\frac{\delta_j-\delta_i}{2}\right)}{\left(\sum_{i=1}^{n}\kappa_i\right)^2}. \qquad (30)$$

If only two paths exist (with parameters $K_1 = 1$, $K_2 = K$, $\delta_1 = 0$, $\delta_2 = \delta$), formula (30) becomes:

$$\Delta F_{AM} = \left(F_0 + \frac{1}{M}\right)\frac{2\kappa\sin^2\frac{\delta}{2}}{(1+\kappa)^2}.$$

In the case of phase modulation, the author arrives at the general formula

Card 8/10

New methods for evaluating distortions ...

$$F_{PM} = \frac{1}{\Delta\varphi} \operatorname{arc\,tg} \left[\frac{\sum_{l=1}^{n} \kappa_l \sin(\Delta\varphi\xi_l + \vartheta_l)}{\sum_{l=1}^{n} \kappa_l \cos(\Delta\varphi\xi_l + \vartheta_l)} \right]. \tag{34}$$

$$\Delta F_{PM} = \frac{1}{\Delta\varphi} \operatorname{arc\,tg} \left[\frac{\kappa \sin(\Delta\varphi\xi + \vartheta)}{1 + \kappa \cos(\Delta\varphi\xi + \vartheta)} \right]. \tag{35}$$

for two paths only. In these formulae, $\Delta\varphi$ is the modulation index, and $\xi_i = F_o(t + \tau_i) - F(t)$. The corresponding formulae for the case of frequency modulation are:

$$\Delta F_{FM} = \frac{\sum_{l=1}^{n} \kappa_l \cos\varphi_l \sum_{l=1}^{n} \xi_l' \kappa_l \cos\varphi_l + \sum_{l=1}^{n} \kappa_l \sin\varphi_l \sum_{l=1}^{n} \xi_l' \kappa_l \sin\varphi_l}{\left(\sum_{l=1}^{n} \kappa_l \sin\varphi_l\right)^2 + \left(\sum_{l=1}^{n} \kappa_l \cos\varphi_l\right)^2} \tag{36}$$

Card 9/10

SMIRNOV, V.A., kand. tekhn. nauk; SHIKANOV, Ye.P., red.; PETRIKOVA, L.I., tekhn. red.

[Amplidynes]Elektromashinnye usiliteli. Moskva, Voenizdat, 1962. 72 p. (MIRA 15:10)
(Rotating amplifiers)

KOLOSOV, S.P., doktor tekhn. nauk; SMIRNOV, V.A., inzh.

Static characteristics of a hydraulic amplifier with a jet pipe and standard load. Trudy MAI no.155:60-71 '64. (MIRA 17:11)

KOLOSOV, S.P., doktor tekhn. nauk; PUTINSEV, V.A., inzh.; SMIRNOV, V.A., inzh.; SHELENKOV, V.M., inzh.

Calculation of reversive networks with a.c. power supply. Trudy MAI no.155:90-109 '64. (MIRA 17:11)

KOLOSOV, S.P., doktor tekhn nauk; OSTRYAKOV, I.A., inzh.; SMIRNOV, V.A., inzh.; SHELENKOV, V.M., inzh.

Calculation of circuits with current conducting polymers. Trudy MAI no.155:120-131 '64. (MIRA 17:11)

PETROVICH, Nikolay Timofeyevich; KAMENEV, Yevgeniy Fedorovich; SMIRNOV, V.A., doktor tekhn. nauk, prof., retsenzent; GANIN, I.K., red.

[Problems of radio communication in outer space] Voprosy kosmicheskoi radiosviazi. Moskva, Sovetskoe radio, 1965. 312 p. (MIRA 18:2)

their activation. Orig. art. has: 5 figures.

Card 1/1 SUB CODE: 09 / SUBM DATE: 28Mar66 / ORIG REF: 001 UDC: 621.385.032

SHLEKOV, V.A., Cand Tech Sci—(diss) " Study of heat-exchange upon condensation of pure saturated vapors on the vertical pipes in the field of laminar flow of the film condensate." Minsk, 1953. 9 pp (Min of Higher Ed USSR. Minsk Order of Labor Red Banner Polytech Inst im I. V. Stalin), 150 copies (KL, 27-53, 115)

-117-

BUROV, Yu.G.; SMIRNOV, V.A.

Meeting of the International Coordination Commitee on the Properties of Steam. Inzh.-fiz. zhur. no. 9:128-130 S '58. (MIRA 11:10)
(Steam)

KUMSKOV, V.T., dotsent, kand.tekhn.nauk; SMIRNOV, V.A., starshiy nauchnyy sotrudnik, kand.tekhn.nauk

Theory of similitutde and its application in heat engineering. Inzh.-fiz.zhur. no.4:142-144 Ap '60. (MIRA 13:8)
(Dimensional analysis) (Heat engineering)

S/170/60/003/011/016/016
B019/B056

AUTHORS: Kumskov, V. T., Pokalyuk, A. I., Smirnov, V. A.

TITLE: Intercollegiate Conference on the Principle of Similarity and Its Application in Heat Engineering

PERIODICAL: Inzhenerno-fizicheskiy zhurnal 1960, Vol. 3, No. 11, pp. 120-124

TEXT: From June 6 to June 10, 1960, the mezhvuzovskaya konferentsiya po teorii podobiya i yeye primeneniyu v teplotekhnike (Intercollegiate Conference on the Principle of Similarity and Its Application in Heat Engineering) was held at the Moskovskiy institut inzhenerov transporta (MIIT) (Moscow Institute of Transportation Engineers). The Conference was attended by roughly 500 scientific workers. 68 lectures were delivered. After the opening words spoken by the President of the Organization Committee Deputy Chief of the MIIT, Professor A. I. Ioannisyan, Professor P. K. Konakov (MIIT) began his lecture on "The Present Stage of the Principle of Similarity and the Perspectives of Its Application in Heat Engineering". Academician of the AS BSSR, A. V. Lykov of the Institut

Card 1/10

energetiki AN BSSR (Institute of Power Engineering of the AS BSSR) investigated problems of the integral transformations and operator methods and their relations to the principle of similarity. Professor V. A. Venikov of the Moskovskiy energeticheskiy institut (Moscow Institute of Power Engineering), holder of the Lenin Prize, investigated problems concerning the relations between investigations carried out on models, in nature, and analytical investigations. Professor S. G. Teletov of the Institut atomnoy energii AN SSSR im. I. V. Kurchatova (Institute of Atomic Energy of the AS USSR imeni I. V. Kurchatov) in his lecture studied the planning of experimental investigations in correspondence with the demands made by the principle of similarity. According to the opinion of Professor A. A. Gukhman of the Moskovskiy institut khimicheskogo mashinostroyeniya (Moscow Institute of Machine Construction), the most important problem is that of the development of methods by means of which it is possible to built up the characteristic variables of a physical problem. Professor Ye. V. Kudryavtsev of the ENIN AS USSR attached great importance to the principle of similarity in the investigation of heat exchange processes. Professor L. I. Kudryashchev of the Kuybyshevskiy aviatsionnyy institut

Intercollegiate Conference on the Principle of Similarity and Its Application in Heat Engineering

S/170/60/003/011/016/016
B019/B056

(Kuybyshev Aviation Institute) and Candidate of Technical Sciences A. G. Temkin of the Kaliningradskiy tekhnicheskiy institut rybnoy promyshlennosti i khozyaystva (Kaliningrad Technical Institute of the Fisheries and Economics) also delivered lectures which are not dealt with in detail. The theoretical section of the Conference was under the chairmanship of Professor Konakov. Here, 17 lectures were delivered. The lecture by B. V. Kantorovich of the Institut goryuchikh iskopayemykh AN SSSR (Institute of Fuel Minerals of the AS USSR) had the title "The Application of the Principle of Similarity in Investigations of Combustion Processes". The lectures delivered by V. A. Shvab M. Ye. Dogin of the Tomskiy elektromekhanicheskiy institut inzhenerov zheleznodorozhnyy transporta (Tomsk Electromechanical Institute for Railroad Engineers) and by Z. M. Kudryavtseva of the TsNIIchermet dealt with the application of the principle of similarity in investigations of the motions of drop-gas mixtures in pipelines. The lectures delivered by Professor L. I. Kudryashov (Kuybyshev Aviation Institute) and Professor A. V. Teplov of the Voyennaya akademiya tyla i transporta (Military Academy for Supplies and Transportation) dealt with the gas dynamical simulation of

Card 3/ 10

Intercollegiate Conference on the Principle of Similarity and Its Application in Heat Engineering

municipal gas lines. V. M. Golovin (Kuybyshev Aviation Institute) dealt with the estimation of the dissipation of mechanical energy in motions of liquids. V. O. Fogel' of the Moskovskiy institut tonkoy khimicheskiy tekhnologii (Moscow Institute of Chemical Technology) investigated the application of the principle of similarity and the electric simulation for the investigation of vulcanization processes. A. V. Temikov (Kuybyshev Aviation Institute) delivered a lecture on "The Similarity of Phenomena of Nonsteady Heat Conduction in Metals". G. P. Ivantsov (TsNIIchermet) dealt with the application of gauge transformations to problems of mathematical physics and heat engineering. A. M. Kulik (Institute of Atomic Energy of the AS USSR imeni I. V. Kurchatov) investigated the application of the principle of similarity to nonsteady temperature fields. Yu. N. Zakharov of the Novosibirskiy institut inzhenerov vodnogo transporta (Novosibirsk Institute for Water-transportation Engineers) investigated the rules governing the functioning of jets. The application of the principle of similarity for the purpose of investigating the nonsteady temperature fields in complex bodies was dealt with by A. G. Temkin. A. M. Shedrin of the Nauchno-issledovatel'skiy institut sel'skogo stroitel'stva (Scientific

Card 4/ 10

Intercollegiate Conference on the Principle of Similarity and Its Application in Heat Engineering

S/170/60/003/011/016/016
B019/B056

Research Institute for Rural Constructions) investigated the application of the principle of similarity to elasticity effects. The section for heat-mass exchange was under the chairmanship of Academician of the AS BSSR A. V. Lykov. Yu. A. Mikhaylov of the Institut energetiki i elektrotekhniki AN Latv. SSR (Institute of Power Engineering and Electrotechnics of the AS Latviyskaya SSR) investigated heat-mass exchanges in disperse media. A. V. Ralko of the Kiyevskiy politekhnicheskiy institut (Kiyev Polytechnic Institute) investigated the simulation of glowing processes. G. N. Sizov of the Tsentral'nyy nauchno-issledovatel'skiy institut ekonomiki i ekspluatatsii vodnogo transporta (Central Scientific Research Institute for the Productivity and Exploitation of Water Transports) investigated the simulation of the turbulent heat exchange. Z. M. Miropol'skiy of the Moskovskiy lesotekhnicheskiy institut (Moscow Institute of Forestry) investigated the heat exchange in the condensation of high tension steam. B. I. Kolbasov (Institute of Atomic Energy of the AS USSR imeni Kurchatov) spoke about the results of an investigation of the heat exchange in the critical region in the flow of carbonic acid in tubes. Most of the lectures were delivered in the section for heat exchange. The section was supervised

Card 5/ 0

Inter-collegiate Conference on the Principle of Similarity and Its Application in Heat Engineering

S/170/60/003/011/016/016
B019/B056

by Professor P. N. Pomanenko. Professor A. M. Gurvich of the TsKTI imeni Polzunov reported on research work in the Laboratoriya luchistogo teploobmena TsKTI (Laboratory of Radiation Heat Exchange of the TsKTI) carried out in the course of recent years. Ye. P. Karasev of the Leningradskoye vyssheye voyenno-morskoye inzhenernoye uchilishche im. Dzerzhinskogo (Leningrad Higher Naval Engineering School imeni Dzerzhinskiy) dealt with the simulation of steam aggregates. P. N. Pomanenko investigated the resistance and the heat exchange of a turbulent gas flow in diffuser channels. V. P. Motulevich of the ENIN AS USSR dealt with the heat exchange and the friction of plates in a gas flow. B. S. D yachenko of the Nikolayevskiy korablestroitel'nyy institut im. admirala Makarova (Nikolayev Shipbuilding Institut imeni Admiral Makarov) dealt with the estimation of heat exchangers of gas turbines in shipbuilding. V. G. Derefeyev of the Novocherkasskiy politekhnicheskiy institut (Novocherkassk Polytechnic Institute) gave the results of an investigation of the heat exchange of electrolocomotive resistors. P. M. Brdlik G. Ye. Verevochkin, and V. A. Smirnov (MIIT ENIN AS USSR) investigated the heat exchange between jets and plates. Ye. V. Kudryavtsev and K. N. Kachalev (ENIN AS

Card 6/ 6

Intercollegiate Conference on the Principle of Similarity and Its Application in Heat Engineering

S/170/60/003/011/016/016
B019/B056

USSR) investigated the operation of an electronic universal calorimeter. K. F. Aksenov of the Vsesoyuznyy zaochnyy institut inzhenerov transporta (All Union Correspondence Institute for Transportation Engineers) reported on experimental data concerning a heat exchanger. S. S. Filimonov and B. A. Khrustalev (ENIN AS USSR) reported on thermotechnical investigations of the flow of a liquid through tubes. A. I. Leont'yev (Moscow Institute of Forestry) N. Ye. Ninua of the Gruzinskiy politekhnicheskiy institut (Georgian Polytechnic Institute) G. P. Boykov (Tomsk Polytechnic Institute) I. S. Kochenov and G. Ye. Morozov (Institute of Atomic Energy of the AS USSR imeni I. V. Kurchatov) A. A. Smirnov (Kuybyshev Aviation Institute) and V. G. Ushakov of the Novocherkasskiy politekhnicheskiy institut (Novocherkassk Polytechnic Institute) delivered lectures which are mentioned in passing only. The last day was devoted to the works in the Simulation Laboratory of the Kafedra "Teplosilovyye ustanovki" MIITa (Chair of "Thermal Power Plants" of the MIIT). A lecture delivered by P. K. Konakov was on "The Rules of the Complex Heat Exchange". V. T. Kumskov (MIIT) delivered the lecture "An Investigation of the Complex Heat-Exchange in Combustion Chambers". V. I. Lebedev reported on

Card 7/10

Intercollegiate Conference on the Principle of Similarity and Its Application in Heat Engineering

S/170/60/003/011/016/016
B019/B056

"An Investigation of the Action of the Degree of Blackening Upon the Heat Exchange in Combustion Chambers". The section for thermal power machines was under the supervision of Professor V. V. Lakhanin (Novosibirsk Institute for Water Transportation Engineers). In his lecture he dealt with a detailed analysis of the heat calculation of piston machines. In this connection B. Kh. Draganov of the Ukrainskaya akademiya sel'skokhozyaystvennykh nauk (Ukraine Academy of Economics) is mentioned. The collaborators of the Central Scientific Research Institute of Economics and Exploitation of Water Transportation carried out experiments on the application of the principle of similarity for transport calculations. S. N. Dashkov (Military Academy for Supplies and Transportation) spoke about the application of the principle of similarity in the calculation of motorcar engines. M. G. Kruglov and N. P. Kozlov of the MVTU imeni Bauman gave a report on the application of the principle of similarity in the investigation of processes in combustion engines. L. I. Fomkinskiy (Central Scientific Research Institute of Economics and the Exploitation of Water Transportation) investigated the methods of calculating river transportation. B. I. Buber of the Murmanskoye vysshaye morakhodnoye

Card 8/10

Intercollegiate Conference on the Principle of Similarity and Its Application in Heat Engineering

S/170/60/003/011/016/016
B019/B056

uchilishche (Murmansk Higher College of Navigation) investigated the optimum operation conditions for steam engines for ships. Ye. A. Nikitin of the Kalomenskiy teplovozostroitel'nyy zavod im. Kuybysheva (Kalomensk Steam Locomotive Factory imeni Kuybyshev) spoke about investigations of compressorless Diesel engines by means of the principle of similarity. M. P. Aleksandrov of the MVTU imeni Bauman applied the principle of similarity to the determination of the heating of braking systems. V. D. Zinevich of the Leningradskiy gornyy institut (Leningrad Mining Institute) investigated pneumatic motors produced by the factory "Pnevmatika" of the Lengorsovnarkhoz on the basis of the principle of similarity. B. Kh. Draganov (Ukraine Academy of Economics) and K. Ye. Ucheshko (Nikolayev Shipbuilding Institute imeni Admiral Makarov) studied the application of the principle of similarity to steam-power engines. The section made decisions concerning the further development of the application of the principle of similarity, which are summarized in form of three points. Furthermore, the senior editor of the "Inzhenerno fizicheskiy zhurnal", Academician of the AS BSSR A. V. Lykov is requested to publish works on the principle of similarity regularly. Energoizdat is requested to

Card 9/10

S/649/61/000/139/015/018
I028/1228

AUTHORS: Brdlik, P. M., Verevochkin, G. E. and Smirnov, V. A.

TITLE: Heat exchange between a jet and a plate placed normal to the stream

SOURCE: Moscow. Institut inzhenerov zheleznodorozhnogo transporta. Trudy, no. 139. 1961. Teoriya podobiya i yeye primeneniye v teplotekhnike; trudy pervoi mezhvuzovskoy konferentsii, 182–192

TEXT: The paper describes the results of an investigation of heat exchange between a heated water jet and a plate normal to it. The study of Perry and Thurlow is too restricted in scope, their conclusions being valid only within a narrow range of variation of the basic parameters Re, d, h/d (d = nozzle diameter, h = distance from the nozzle to the plate). In the present work, the range of variation of these parameters was $d = 2.5 \div 30.0$ mm, $Re_d = 50 \div 31000$, $h/d = 0.04 \div 8.0$. The experimental data suggests the existence of three different zones, according to the value of h/d: a) for $h/d \leq 0.5$, the experimental data obtained satisfy relationship (4); b) for $0.5 < h/d < 10$, the empirical relationship (7) is derived from the experimental data; c) for $h/d > 10$, formula (8) is proposed, with some reservations due to insufficient data, by extrapolation

Card 1/2 Note: ÷ indicates 'to'

S/649/61/000/139/017/018
1028/1228

AUTHORS: Konakov, P. K., Smirnov, V. A. and Verevochkin, G. E.

TITLE: Criteria for the thermal process of obtaining ingots by Chokral'skiy's method

SOURCE: Moscow. Institut inzhenerov zheleznodorozhnogo transporta. Trudy, no. 139. 1961. Teoriya podobiya i yeye primeneniye v teplotekhnike: trudy pervoi mezhvuzovskoy konferentsii, 210–217

TEXT: The paper describes a heat process for ingot growth and determines its criterial relationships. In the Chokral'skiy method, a priming fastened to a rotating shaft that can also move along the vertical is introduced into a melt contained in a vacuum furnace; an ingot is thereby extracted from the melt, passing during its growth through zones of different temperatures. The extraction of the ingot is described by its equations for continuity, motion and heat propagation of the melt, and the equation for heat propagation in the ingot. The conditions of single-valuedness are added to these equations. (a) At the boundary between the solid and liquid phases, the equations of matter and heat balance connect the magnitudes appearing in the equations. (b) This process is non-stationary, (c) The physical constants of the melt and the ingot depend on temperature of the melt and the ingot and criterial equations are determined as a results. There is 1 figure.

ASSOCIATION: Moskovskiy institut inzhenerov zheleznodorozhnogo transporta (Moscow Institute of Railway Transport Engineers).

Card 1/1

KUMSKOV, Viktor Timofeyevich, kand. tekhn. nauk; MAKHAN'KO, Mikhail Grigor'yevich; BARTOSH, Ye.T., kand. tekhn. nauk, retsenzent; SMIRNOV, V.A., kand. tekhn. nauk, red.; BOBROV, Ye.N., tekhn. red.

[Fundamentals of heat engineering] Osnovy teplotekhniki. Moskva, Transzheldorizdat, 1962. 231 p. (MIRA 15:6)
(Heat engineering)

GUREVICH, I.L.; L'VOVA, A.I.; SMIRNOV, V.A.

Products of deasphalting as a catalytic cracking stock. Khim.i tekh.topl.i masel 7 no.8:32-35 Ag '62. (MIRA 15:8)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akad. Gubkina.

(Cracking process)

SOV/70-4-4-10/34

AUTHORS: Zhuravlev, N.N. and Smirnov, V.A.

TITLE: X-ray Determination of the Structure of Cs_3Bi

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 4, pp 534-537 (USSR)

ABSTRACT: $CsBi_2$, which is a super-conductor at 4.75 °K, is known to have a Cu_2Mg-type structure with $a = 9.746 \pm 0.005$ Å and minimum interatomic distances of Bi-Bi = 3.44, Bi-Cs = 4.04, Cs-Cs = 4.22 Å. New data on Cs_3Bi is now presented. Cs_3Bi was prepared under vacuum or under decalin by alloying the two elements. The alloy heated to 90 ° could be broken up with a pestle and shaken through a Ni grid into a capillary tube, where it was sealed off. Powder photographs in an 86 mm dia camera showed a cubic cell with $a = 9.305 \pm 0.006$ Å. Cs_3Bi was seen to be isomorphous with Cs_3Sb, the structure of which is known. The space group is $Fd3m - O_h^7$ and there are Cs atoms

Card1/3

X-ray Determination of the Structure of Cs_3Bi

in 8(a) positions and 4Cs + 4Sb in the 8(b) positions. Observed and calculated values of the intensities for Cs_3Bi were compared and agreed satisfactorily.

d_{calc} = 5.01 g/cm^3.

The minimum Bi-Bi distance in Cs_3Bi is 4.03 Å, which is outside the limits within which super-conductivity is found. In both Cs_3Bi and $CsBi_2$, 8 Cs atoms lie in a diamond net in the interstices of which the other atoms are found: in $CsBi_2$, there are tetrahedra of Bi atoms and in Cs_3Bi a statistical arrangement of 4Bi + 4Cs. In both structures the Cs-Bi distances are 4.03 Å but the Bi-Bi distance in $CsBi_2$ is only 3.43 against 4.03 Å in Cs_3Bi.

The change from semiconductivity to super-conductivity can be followed in the series KBi_2, $RbBi_2$, $CsBi_2$

X-ray Determination of the Structure of Ca_3Bi SOV/70-4-4-10/34

as the Bi-Bi distances change. Acknowledgments are made to G.S. Zhdanov.
There are 2 figures, 1 table and 8 references, of which 6 are Soviet and 2 English.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: December 4, 1958

Card3/3

24.7100

78111
SOV/70-5-1-20/30

AUTHORS: Zhuravlev, N. N., Smirnov, V. A., Mingazin, T. A.

TITLE: X-Ray Investigation of Compounds Rb_3Bi and Rb_3Sb (Brief Communication)

PERIODICAL: Kristallografiya. 1960, Vol 5, Nr 1, pp 134-137 (USSR)

ABSTRACT: $RbBi_2$, a superconductor, has been known to form cubic crystals with a = 9.609 A and bond lengths Bi-to-Bi 3.40 A; Rb-to-Bi 3.98 A; Rb-to-Rb 4.16 A. Semiconductors Rb_3Bi and Rb_3Sb were produced by melting the mixtures of the respective metals. The obtained products were pure Rb_3Bi, and a mixture of Rb_3Sb crystals with those of RbSb. All are dark-gray, brittle, and chemically more active than metallic Rb. The X-ray data proved the hexagonal symmetry of Rb_3Bi, whose identity periods were a = 6.42 ± 0.02 A and c = 11.46 ± 0.05 A; Rb_3Sb proved also to be hexagonal

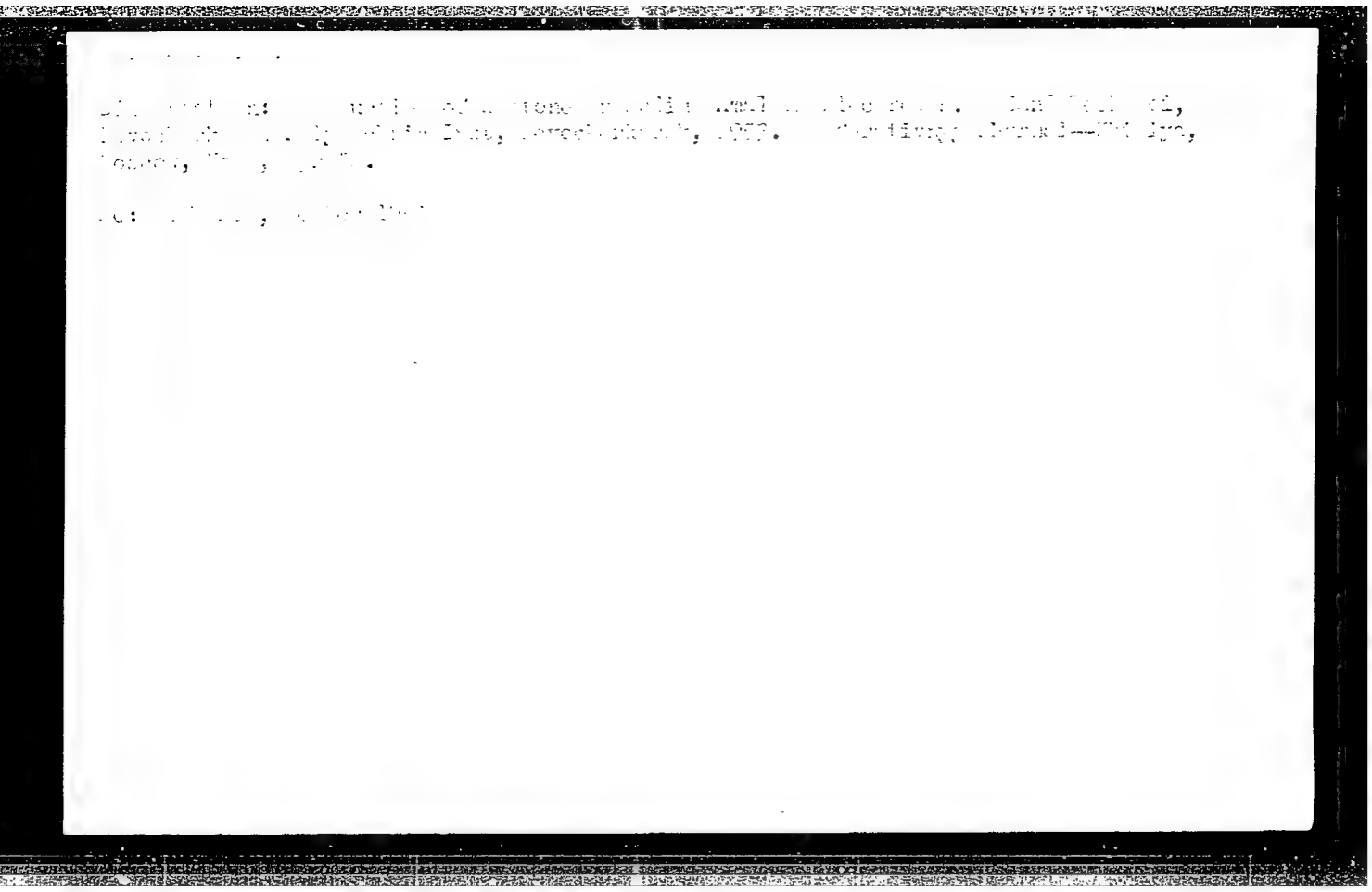
Card 1/3

X-Ray [illegible] of Compounds Ro_Bi and Ro_Sb (Brief Communication) 78111
SOV 70-5-1-20 30

ASSOCIATION: Moscow State University imeni M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova)

SUBMITTED: September 24, 1959

Card 3/ 4



20-5-43/67

AUTHOR SMIRNOV V.A., ANTROPOV L.I.

TITLE Zero Points of Diluted Sodium Amalgams.
(Nulevyye tochki razbavlennykh amal'gam natriya -Russian)

PERIODICAL Doklady Akademii Nauk SSSR,1957,Vol 113,Nr 5,pp 1098-1101(U.S.S.R.)
Received 7/1957 Reviewed 8/1957

ABSTRACT In the course of the past ten years the important part played by the potential of the zero charge or the metal zero point MeEq-0 in connection with various electrochemical processes has been recognized.Therefore the determination of the zero point of diluted amalgams is of considerable interest. Many amalgams have been used for the reduction of organic and anorganic substances. The finding of zero points is rendered difficult in the case of the amalgams of alkali metals by their relatively easy oxidizability and by the rather rapid decomposition of electrolytes by aqueous solution.Besides, the exchange currents between the amalgams and the solution which contain ions of the respective metal, are usually great,and therefore current consumption is necessarily rather high in order that a noticeable potential shift from the equilibrium- or steady value be obtained.This, however, may lead to a change of the upper amalgam layer and to a wrong representation of results.The electrocapillary curves for sodium amalgam in a 1.0 n NaOH solution are shown in table 2. They have a marked maximum which must correspond to the potential of the zero charge of the amalgam of this composition.The position of the maximum of the amalgam is shifted

Card 1/3

composition change in the course of the process of decompostion.
A marked change of zero point of mercury on the occasion of going

Card 2/3 over to diluted amalgams leads us to suppose that also the zero

points of other metals will change in the course of electrolysis in alkali solutions if they are able to form sodium-metallic surface compounds (lead, zinc, etc.). This circumstance may apparently exercise a certain influence on the development and the direction of electrochemical hydration in alkaline solutions. (With 3 illustrations, 1 table, 19 Slavic references).

ASSOCIATION Polytechnical Institute "Sergo Ordzhonikidze" Novocherkask
PRESENTED BY FRUMKIN A.N., Member of the Academy
SUBMITTED 17.9.1956
AVAILABLE Library of Congress
Card 3/3

SMIRNOV, V. A.

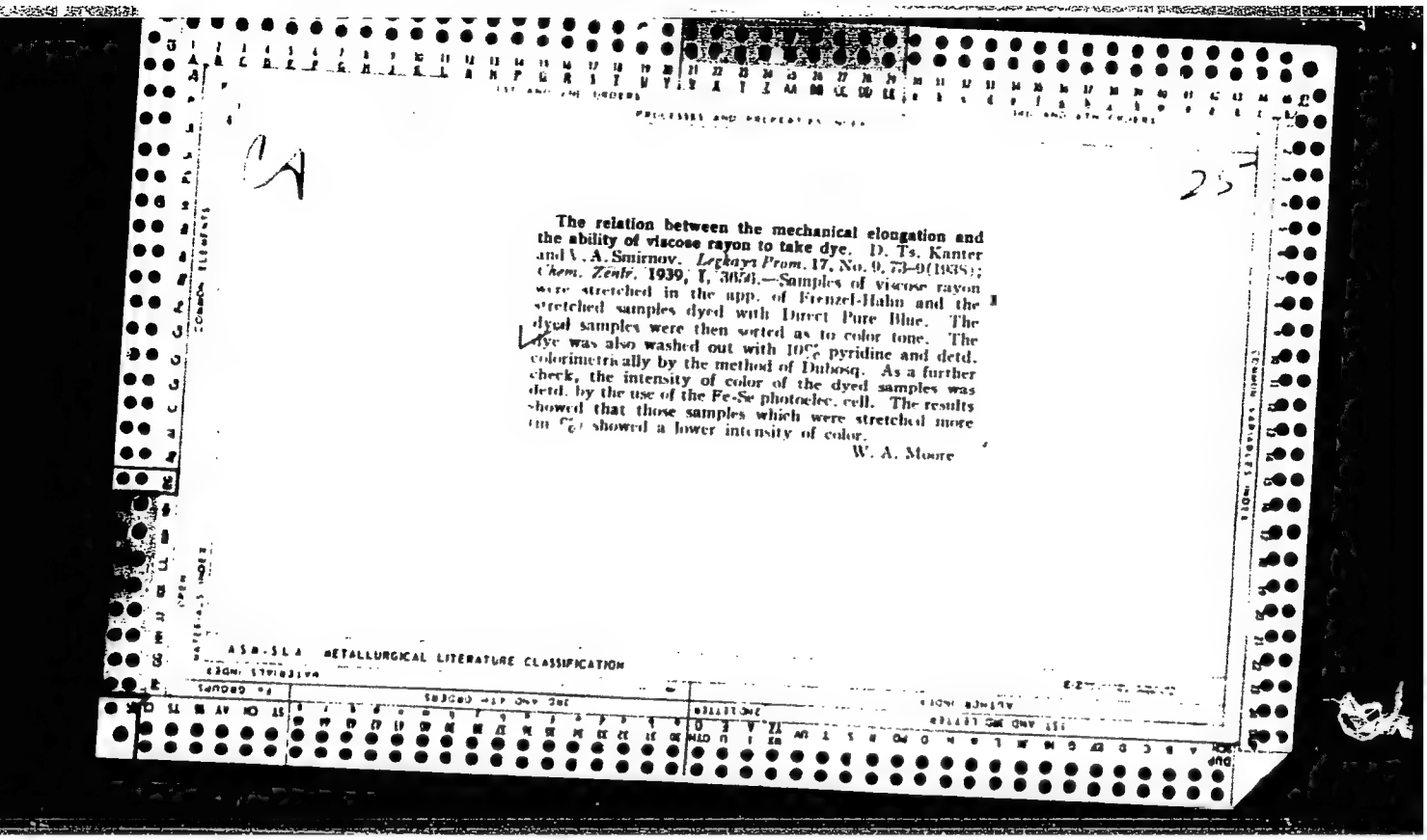
Distr: 4E2b(b)/4E2b(v)/4E2c(m)/4E2d(b)/4E2d(v)/4E3a(w)/4E3c 2 cys

Kinetics of the decomposition of amalgams of sodium and potassium in the presence of some organic compounds. G. N. Slukina, E. A. Ushkova, M. G. Smirnova, and V. A. Smirnov. *Nauch. Raboty Stud. Khim.-Tekhnol. Fak., Novocherkasskii Politekh. Inst. im. S. Ordzhonikidze* 1959, No. 7, 31–8; cf. *Trudy Novocherkassk. Politekh. Inst.* 1958, No. 05, 140.—Mixts. contg. NaOH or KOH, the corresponding metal amalgam, and a reducible org. compd. are studied to det. the effect of the nature of the org. compd. and the effect of the nature of the metal of the amalgam on the rate const. for the process of the decompn. of the amalgam. Glucose, HCHO, and MeCOEt are studied. In all cases a straight line is obtained when $\sqrt{C}$ (C = concn. of amalgam in moles of metal/l. Hg is plotted against time in sec. Deviation from the straight line occurs at the end of the reaction. Into a closed jacketed glass bottle, cooled by circulating H_2O, 250 ml. 1.0N alkali hydroxide contg. 0.25 mole/l. of org. compd. is poured. Three samples are withdrawn, 20 ml. amalgam (concn. 3 mole metal/l. Hg) is added, and electromagnetic stirring at 250 r.p.m. begun. At intervals alkali samples are titrated with 1.0N H_2SO_4. Amalgams are prepd. electrochem. From a previous article by Smirnov (*loc. cit.*) comes the equation $\tau = [2V_{am}\sqrt{C_{M^+}}/K_{decompn.} C'_R(\sqrt{C^0_{M^+}} - \sqrt{C_{M^+}})$, where τ = time of decompn. of amalgam in sec., $V_{am.}$ = vol. of amalgam in l., C_{M^+} = concn. of metal hydroxide, C'_R = surface concn. of org. compd., and $K_{decompn.}$ = rate const. of the decompn. of the amalgam. $K_{decompn.} = (1/F)\exp[(F/2RT)(A_{redn.} - E^0_{am})]$, where $A_{redn.}$ = redn. potential of the org. compd. on Hg or amalgam electrode at D_k = 1.0 amp./sq. cm., measured in a 1.0N soln. of ions of the metal forming the amalgam, which soln. also contains 1 mole/l. of org. compd., and E^0_{am} = 1.8445 v. for Na amalgam and 1.8099 v. for K. Rate consts. calcd. from exptl. data for Na amalgam are 32.5×10^{-7} for HCHO, 1.78×10^{-7} for glucose, and 1×10^{-7} for MeCOEt. For K amalgam these consts. are 53.3×10^{-7}, 3.86×10^{-7}, and 2.44×10^{-7}, resp. The increase in rate consts., e.g., on going from Na to K amalgam with the same org. compd. is detd. by the equation $(_KK_{decompn.}/_{Na}K_{decompn.}) = \exp[(F/2RT)(_{Na}E^0_{am} - _KE^0_{am})]$. The theoretical value of this ratio of rate consts. is 1.65. The exptl. values are 1.64 for HCHO, 2.18 for glucose, and 1.71 for MeC:OEt.

Eurilla Mayerle

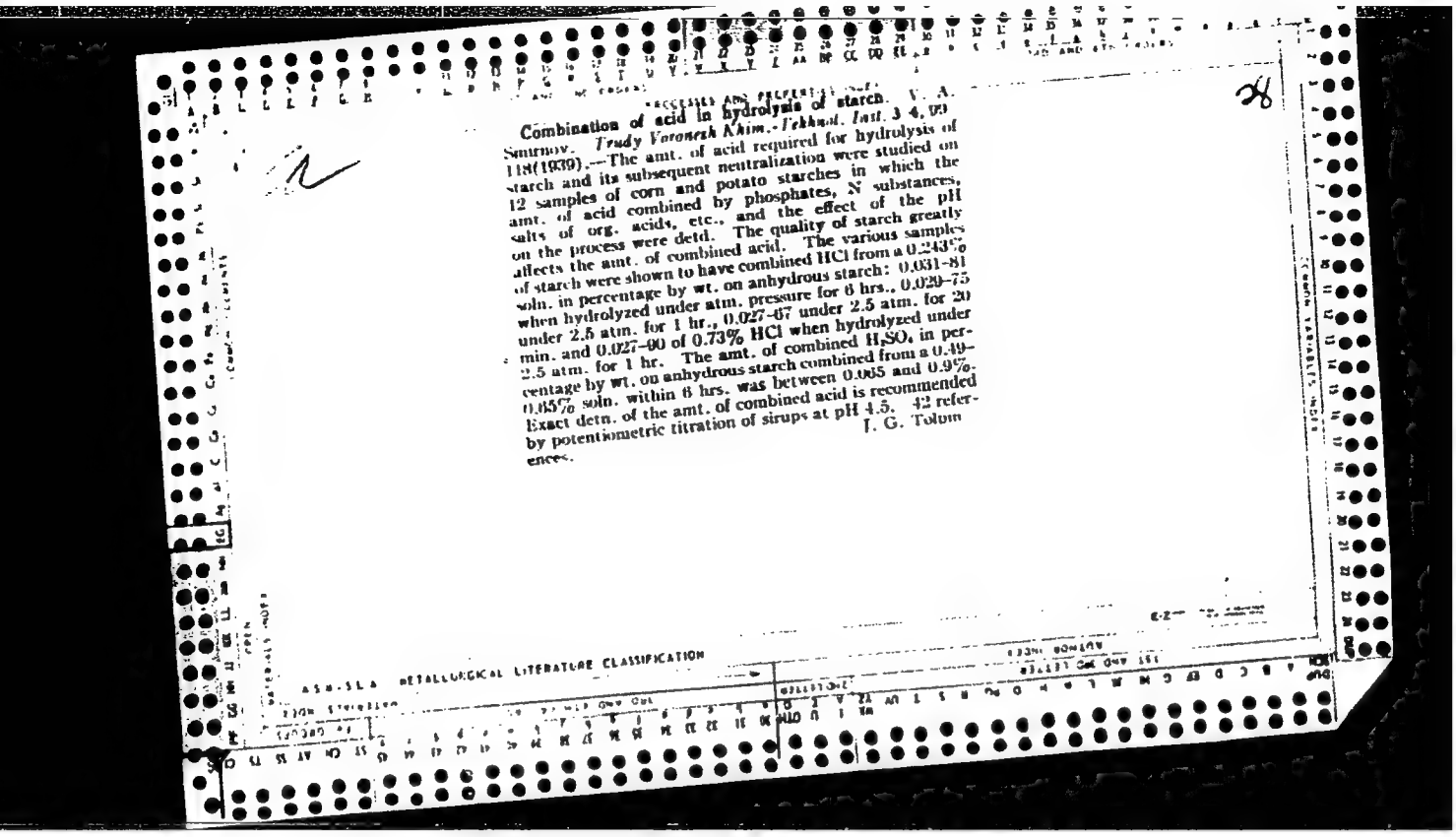
SMIRNOV, V.A.; DEMCHUK, L.A.; ANTROPOV, L.I.

Determination of the zero points of diluted sodium amalgams by the method of "zero solution." Report No.1. Trudy MPI 133:95-111 '62. (MIRA 17:2)

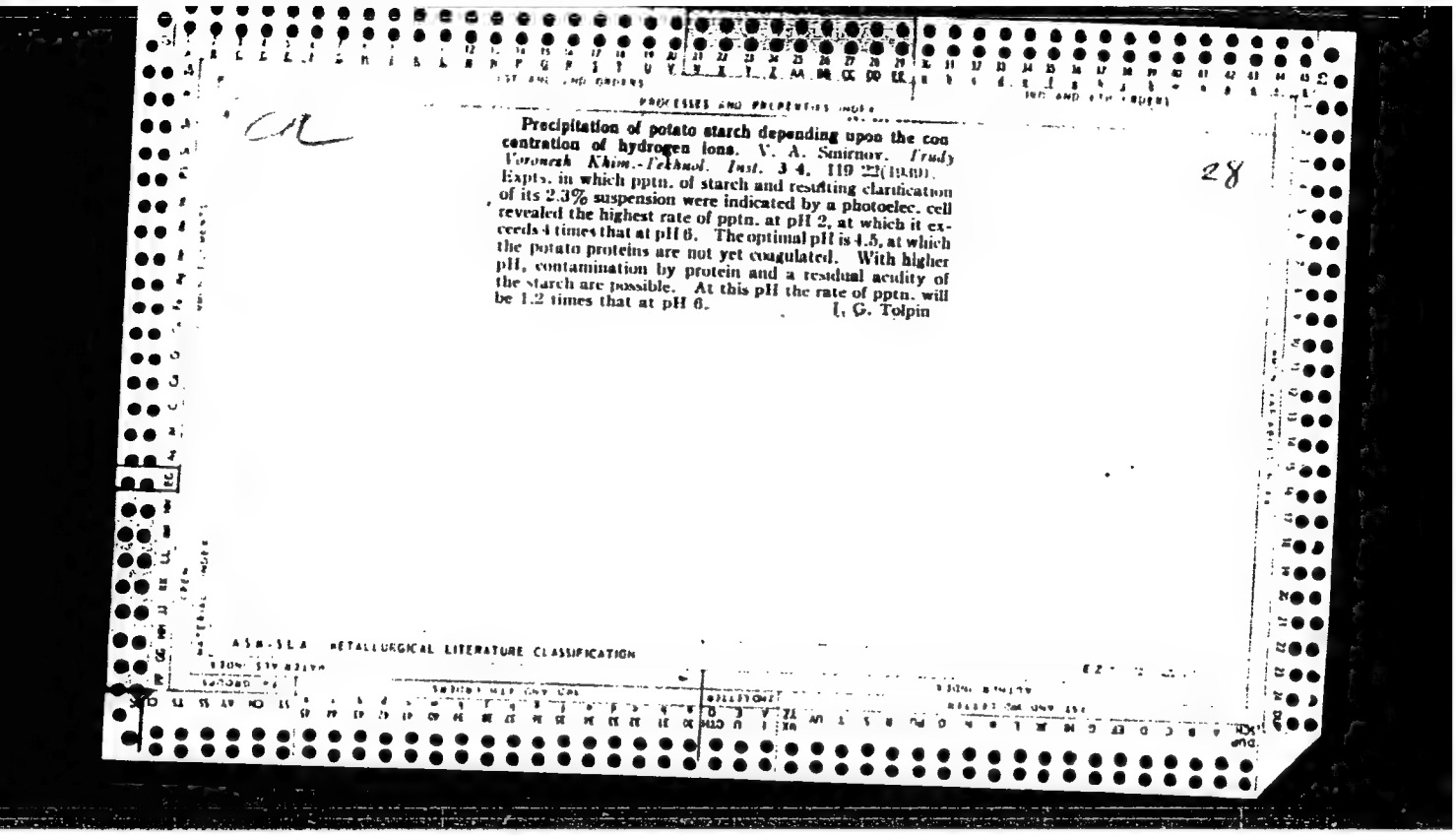


The relation between the mechanical elongation and the ability of viscose rayon to take dye. D. Ts. Kanter and V. A. Smirnov. *Legkaya Prom.* 17, No. 9, 73–9(1938); *Chem. Zentr.* 1939, I, 3074.—Samples of viscose rayon were stretched in the app. of Frenzel-Hahn and the stretched samples dyed with Direct Pure Blue. The dyed samples were then sorted as to color tone. The dye was also washed out with 10% pyridine and detd. colorimetrically by the method of Dubosq. As a further check, the intensity of color of the dyed samples was detd. by the use of the Fe-Se photoelec. cell. The results showed that those samples which were stretched more than 6% showed a lower intensity of color.

W. A. Moore



Combination of acid in hydrolysis of starch. V. A. Smirnov. *Trudy Voronezh Khim.-Tekhnol. Inst.* 3 4, 99-118(1939).—The amt. of acid required for hydrolysis of starch and its subsequent neutralization were studied on 12 samples of corn and potato starches in which the amt. of acid combined by phosphates, N substances, salts of org. acids, etc., and the effect of the pH on the process were detd. The quality of starch greatly affects the amt. of combined acid. The various samples of starch were shown to have combined HCl from a 0.243% soln. in percentage by wt. on anhydrous starch: 0.031–81 when hydrolyzed under atm. pressure for 6 hrs., 0.029–75 under 2.5 atm. for 1 hr., 0.027–67 under 2.5 atm. for 20 min. and 0.027–90 of 0.73% HCl when hydrolyzed under 2.5 atm. for 1 hr. The amt. of combined H_2SO_4 in percentage by wt. on anhydrous starch combined from a 0.49–0.65% soln. within 6 hrs. was between 0.065 and 0.9%. Exact detn. of the amt. of combined acid is recommended by potentiometric titration of sirups at pH 4.5. 42 references. I. G. Tolpin

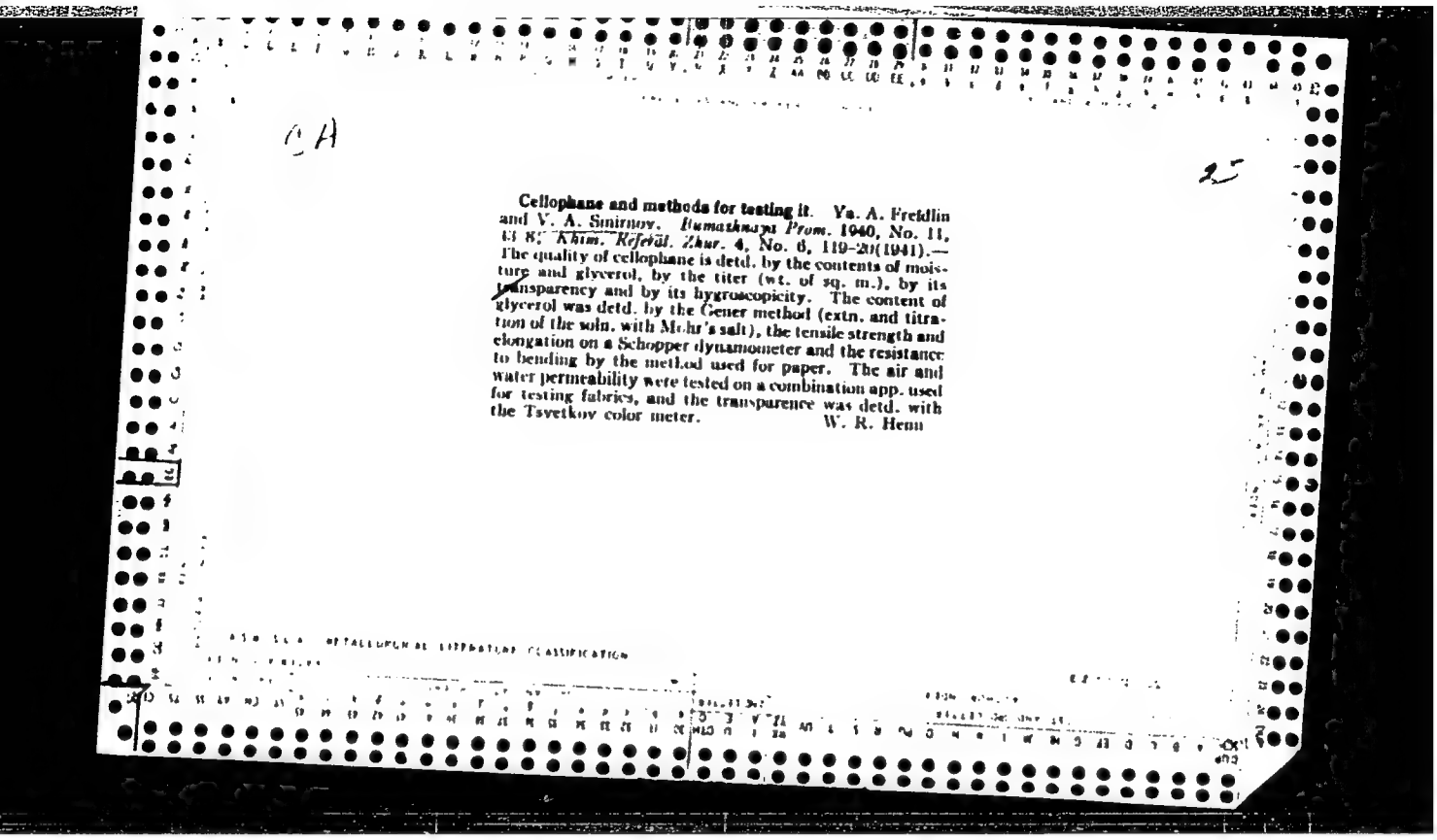


CR

28

Precipitation of potato starch depending upon the concentration of hydrogen ions. V. A. Smirnov. *Trudy Voronezh. Khim.-Tekhnol. Inst.* 3 4, 119-22(1940). Expts. in which pptn. of starch and resulting clarification of its 2.3% suspension were indicated by a photoelec. cell revealed the highest rate of pptn. at pH 2, at which it exceeds 4 times that at pH 6. The optimal pH is 4.5, at which the potato proteins are not yet coagulated. With higher pH, contamination by protein and a residual acidity of the starch are possible. At this pH the rate of pptn. will be 1.2 times that at pH 6. I. G. Tolpin

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

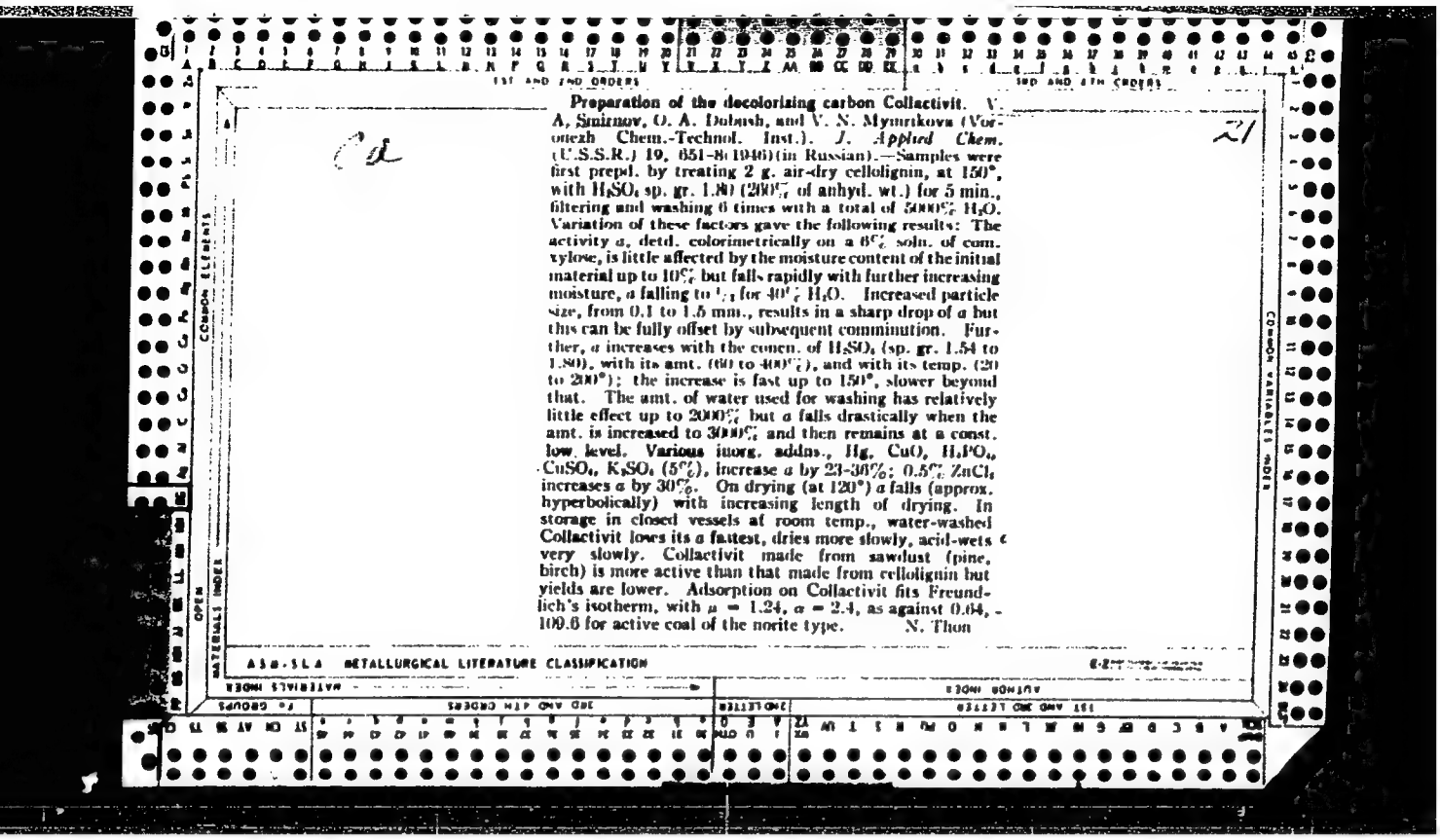


CA

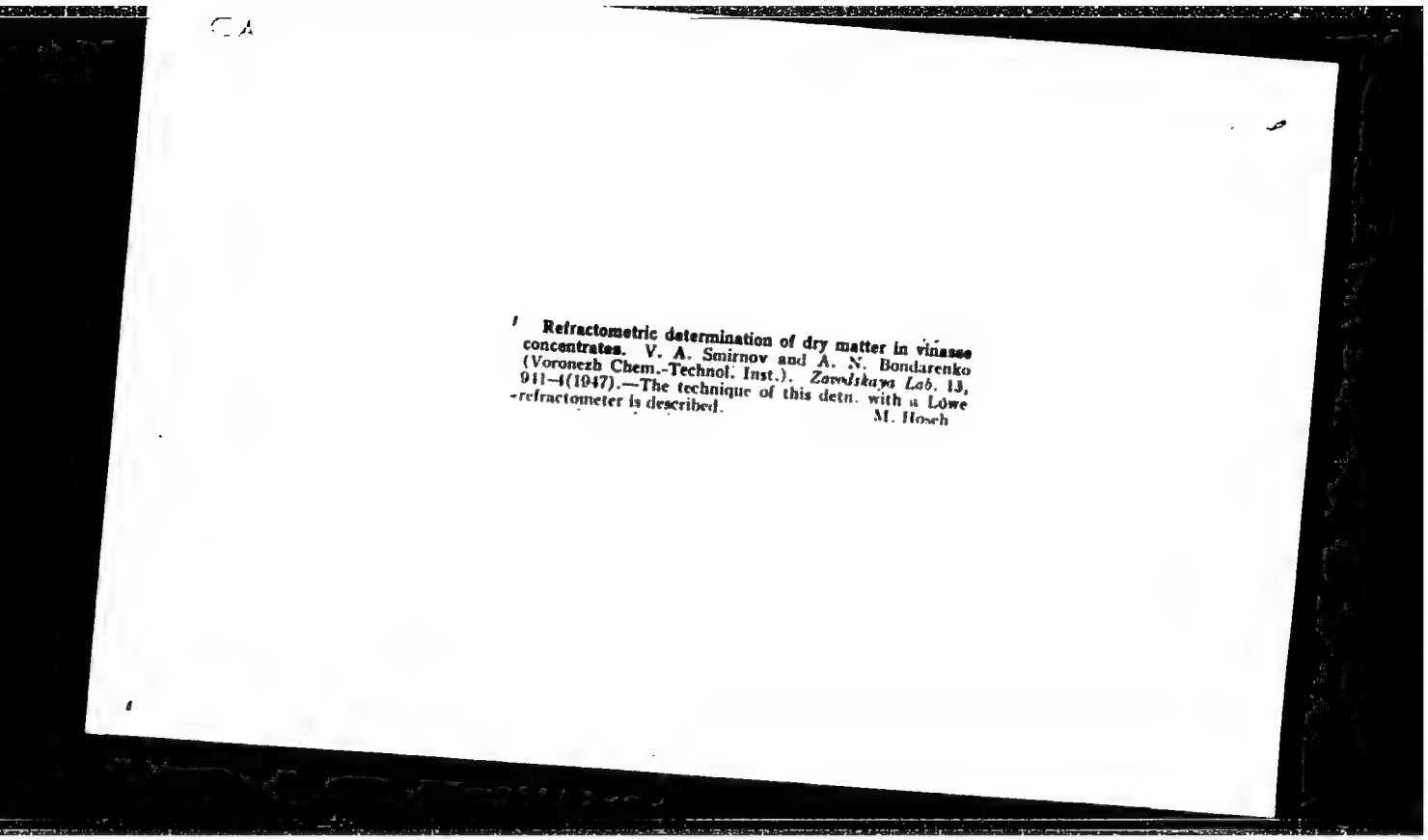
25

Cellophane and methods for testing it. Ya. A. Freidlin and V. A. Smirnov. *Bumazhnaya Prom.* 1940, No. 11, 33-8; *Khim. Referat. Zhur.* 4, No. 6, 119-20(1941).—The quality of cellophane is detd. by the contents of moisture and glycerol, by the titer (wt. of sq. m.), by its transparency and by its hygroscopicity. The content of glycerol was detd. by the Gener method (extn. and titration of the soln. with Mohr's salt), the tensile strength and elongation on a Schopper dynamometer and the resistance to bending by the method used for paper. The air and water permeability were tested on a combination app. used for testing fabrics, and the transparence was detd. with the Tsvetkov color meter.

W. R. Henn

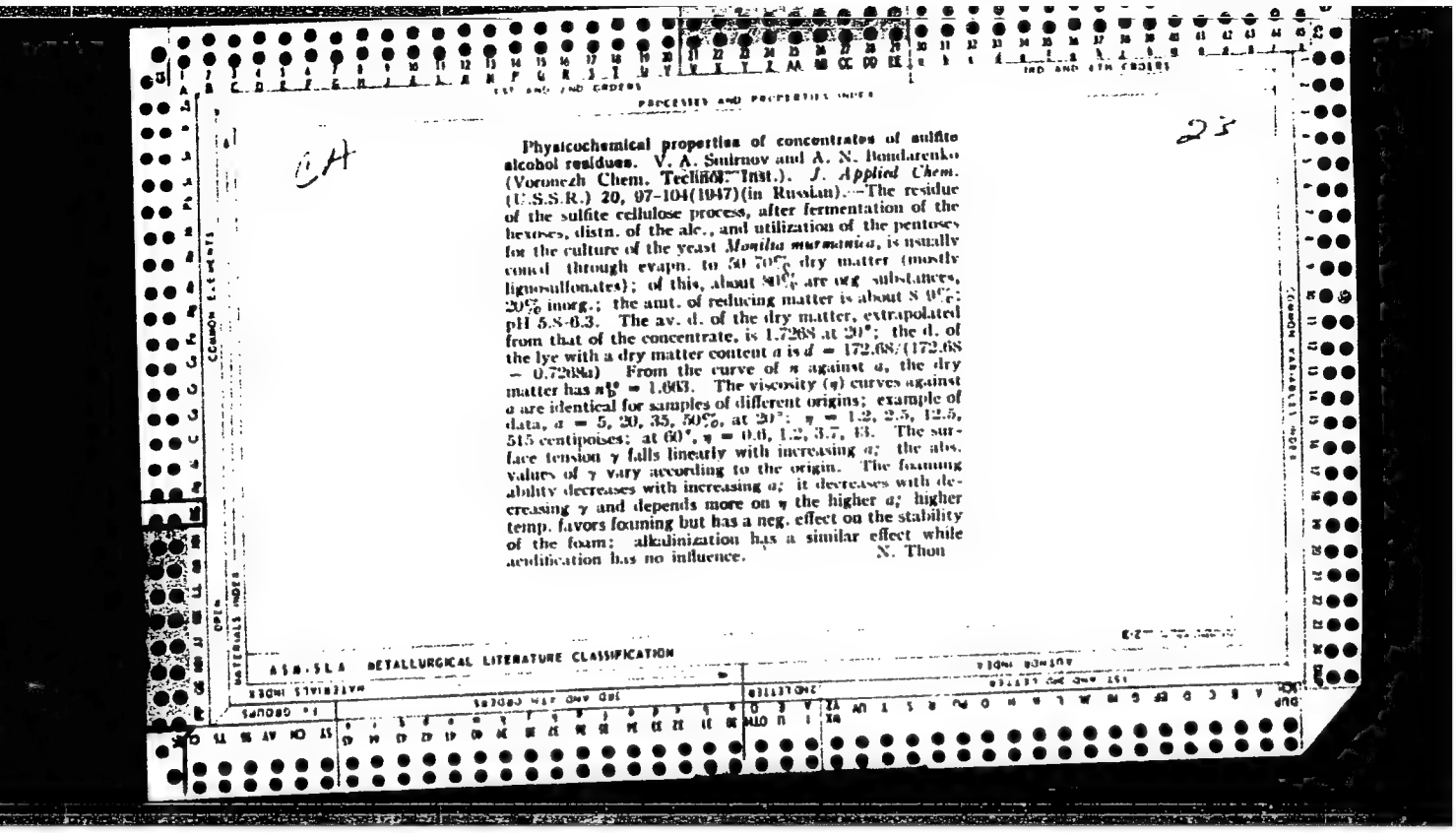


Preparation of the decolorizing carbon Collactivit. V. A. Smirnov, O. A. Dobush, and V. N. Mymrikova (Voronezh Chem.-Technol. Inst.). *J. Applied Chem.* (U.S.S.R.) 19, 851–8 (1946) (in Russian).—Samples were first prepd. by treating 2 g. air-dry cellolignin, at 150°, with H_2SO_4 sp. gr. 1.80 (200% of anhyd. wt.) for 5 min., filtering and washing 6 times with a total of 5000% H_2O. Variation of these factors gave the following results: The activity *a*, detd. colorimetrically on a 6% soln. of com. xylose, is little affected by the moisture content of the initial material up to 10% but falls rapidly with further increasing moisture, *a* falling to ½ for 40% H_2O. Increased particle size, from 0.1 to 1.5 mm., results in a sharp drop of *a* but this can be fully offset by subsequent comminution. Further, *a* increases with the concn. of H_2SO_4 (sp. gr. 1.54 to 1.80), with its amt. (60 to 400%), and with its temp. (20 to 200°); the increase is fast up to 150°, slower beyond that. The amt. of water used for washing has relatively little effect up to 2000% but *a* falls drastically when the amt. is increased to 3000% and then remains at a const. low level. Various inorg. addns., Hg, CuO, H_3PO_4, $CuSO_4$, K_2SO_4 (5%), increase *a* by 23–36%; 0.5% $ZnCl_2$ increases *a* by 30%. On drying (at 120°) *a* falls (approx. hyperbolically) with increasing length of drying. In storage in closed vessels at room temp., water-washed Collactivit loses its *a* fastest, dries more slowly, acid-wets very slowly. Collactivit made from sawdust (pine, birch) is more active than that made from cellolignin but yields are lower. Adsorption on Collactivit fits Freundlich's isotherm, with $\mu = 1.24$, $\alpha = 2.4$, as against 0.64, 109.6 for active coal of the norite type. N. Thon



CA

Refractometric determination of dry matter in vinasse concentrates. V. A. Smirnov and A. N. Bondarenko (Voronezh Chem.-Technol. Inst.). *Zavodskaya Lab.* 13, 911–4(1947).—The technique of this detn. with a Löwe-refractometer is described.
M. Hosch

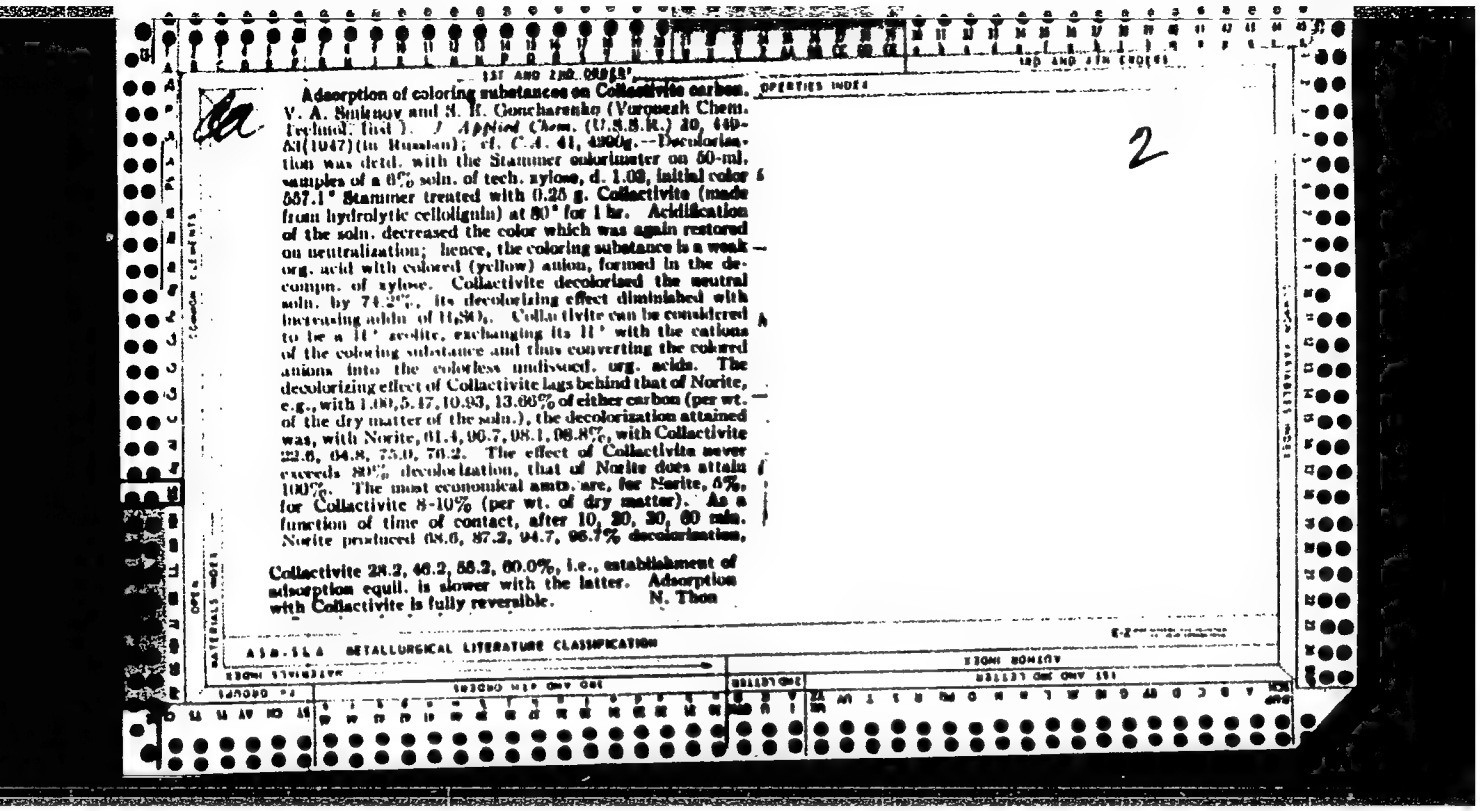


CA

23

Physicochemical properties of concentrates of sulfite alcohol residues. V. A. Smirnov and A. N. Bondarenko (Voronezh Chem. Technol. Inst.). *J. Applied Chem.* (U.S.S.R.) 20, 97–104(1947)(in Russian).—The residue of the sulfite cellulose process, after fermentation of the hexoses, distn. of the alc., and utilization of the pentoses for the culture of the yeast *Monilia murmanica*, is usually concd through evapn. to 50–70% dry matter (mostly lignosulfonates); of this, about 80% are org. substances, 20% inorg.; the amt. of reducing matter is about 8.0%; pH 5.8–6.3. The av. d. of the dry matter, extrapolated from that of the concentrate, is 1.7268 at 20°; the d. of the lye with a dry matter content a is $d = 172.68/(172.68 - 0.7268a)$. From the curve of n against a, the dry matter has $n_D^{20} = 1.663$. The viscosity (η) curves against a are identical for samples of different origins; example of data, a = 5, 20, 35, 50%, at 20°: η = 1.2, 2.5, 12.5, 515 centipoises; at 60°, η = 0.8, 1.2, 3.7, 13. The surface tension γ falls linearly with increasing a; the abs. values of γ vary according to the origin. The foaming ability decreases with increasing a; it decreases with decreasing γ and depends more on η the higher a; higher temp. favors foaming but has a neg. effect on the stability of the foam; alkalinization has a similar effect while acidification has no influence.

N. Thon



Adsorption of coloring substances on Collactivite carbon. V. A. Smirnov and S. K. Goncharenko (Voroneah Chem. Technol. Inst.). *J. Applied Chem.* (U.S.S.R.) 20, 449-51(1947)(in Russian); cf. *C.A.* 41, 4900g.—Decolorization was detd. with the Stammer colorimeter on 50-ml. samples of a 6% soln. of tech. xylose, d. 1.03, initial color 557.1° Stammer treated with 0.25 g. Collactivite (made from hydrolytic cellolignin) at 80° for 1 hr. Acidification of the soln. decreased the color which was again restored on neutralization; hence, the coloring substance is a weak org. acid with colored (yellow) anion, formed in the decompn. of xylose. Collactivite decolorized the neutral soln. by 74.2%, its decolorizing effect diminished with increasing acidity of 11.8%. Collactivite can be considered to be a H' zeolite, exchanging its H' with the cations of the coloring substance and thus converting the colored anions into the colorless undissocd. org. acids. The decolorizing effect of Collactivite lags behind that of Norite, e.g., with 1.09, 5.47, 10.93, 13.66% of either carbon (per wt. of the dry matter of the soln.), the decolorization attained was, with Norite, 91.4, 96.7, 98.1, 98.8%, with Collactivite 22.6, 64.8, 75.0, 76.2. The effect of Collactivite never exceeds 80% decolorization, that of Norite does attain 100%. The most economical amts. are, for Norite, 5%, for Collactivite 8-10% (per wt. of dry matter). As a function of time of contact, after 10, 20, 30, 60 min. Norite produced 68.6, 87.2, 94.7, 96.7% decolorization, Collactivite 28.2, 46.2, 58.2, 60.0%, i.e., establishment of adsorption equil. is slower with the latter. Adsorption with Collactivite is fully reversible.

N. Thon

SMIRNOV, V. A.

PA 64/49T3

USSR/Chemistry - Hemicellulose Jul/Aug 48
Manufacture
Chemistry - Hemicellulose - Uses

"Progress in the Use of Hemicellulose," V. A. Smirnov, Voronezh, 18 pp

"Uspekh Khim" Vol XVII, No 4

Describes use of hemicellulose in the paper industry, its manufacture by acid hydrolysis, use of sulfite liquors, and products obtained from hydrogenation and oxidation of hydrocarbons.

64/49T3

PHASE I BOOK EXPLOITATION SOV/3407

Akademiya nauk SSSR. Energeticheskiy institut im. G.M. Krzhizhanovskogo

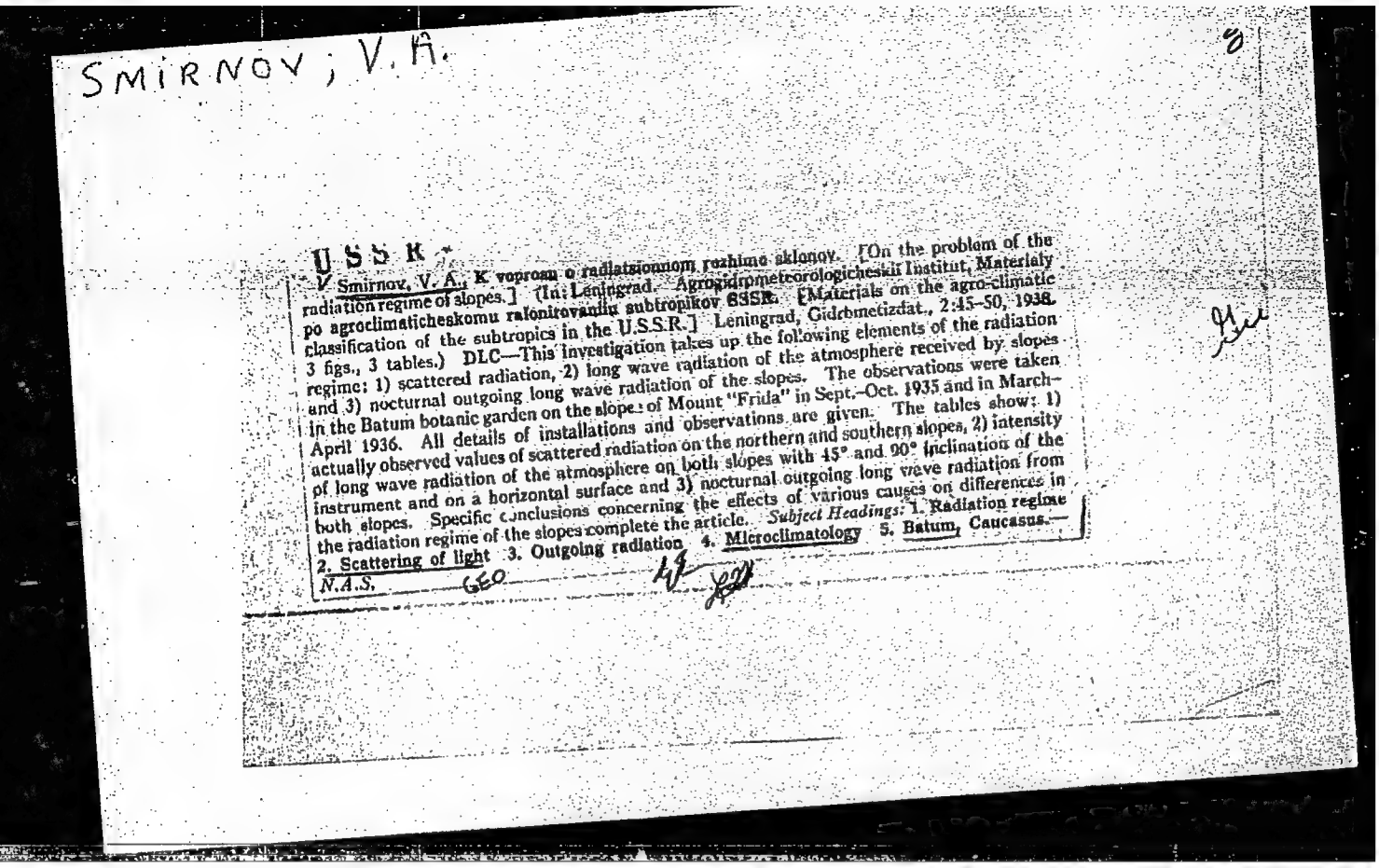
Problemy energetiki; sbornik posvyashchayetsya akademiku G.M. Krzhizhanovskomu (Problems of Power Engineering; Collection of Articles Dedicated to Academician G.M. Krzhizhanovskiy) Moscow, 1959. 851 p. Errata slip inserted. 2,500 copies printed.

Eds. of Publishing House: B.D. Antrushin, P.V. Dubkov, F.I. Dubkov, and S.M. Muzyka; Tech. Ed.: T.A. Prusakova; Editorial Board: A.V. Vinter, Academician (Deceased), V.I. Popkov (Resp. Ed.) Corresponding Member, Academy of Sciences USSR, V.I. Veyts, A.S. Predvoditelev, M.A. Styrikovich, Z.F. Chukhanov, N.B. Bogdanova, Candidate of Technical Sciences, S.K. Kozlov, Candidate of Technical Sciences, M.M. Lebedev, Candidate of Technical Sciences, and I.N. Samdukov.

PURPOSE: This collection of articles is intended as a tribute to the memory of Academician G.M. Krzhizhanovskiy.

COVERAGE: The collection contains sixty articles by former students and coworkers of the deceased Academician. The articles deal with problems of a wide range of subjects in the field of power engineering: problems of the regional development of electrical and thermal power engineering, power engineering technology, and the physics of combustion. No personalities are mentioned. References are given after most articles.

3/4



SMIRNOV, V.A.

USSR

V Smirnov, V. A., K voprosu o radiatsionnom rezhime sklonov. [On the problem of the radiation regime of slopes.] (In: Leningrad. Agrofizicheskii Institut. Materialy po agroklimaticheskomu raionirovaniiu subtropikov SSSR. [Materials on the agro-climatic classification of the subtropics in the U.S.S.R.] Leningrad, Gidrometizdat., 2:45–50, 1938. 3 figs., 3 tables.) DLC—This investigation takes up the following elements of the radiation regime: 1) scattered radiation, 2) long wave radiation of the atmosphere received by slopes and 3) nocturnal outgoing long wave radiation of the slopes. The observations were taken in the Batum botanic garden on the slopes of Mount "Frida" in Sept.–Oct. 1935 and in March–April 1936. All details of installations and observations are given. The tables show: 1) actually observed values of scattered radiation on the northern and southern slopes, 2) intensity of long wave radiation of the atmosphere on both slopes with 45° and 90° inclination of the instrument and on a horizontal surface and 3) nocturnal outgoing long wave radiation from both slopes. Specific conclusions concerning the effects of various causes on differences in the radiation regime of the slopes complete the article. *Subject Headings:* 1. Radiation regime 2. Scattering of light 3. Outgoing radiation 4. Microclimatology 5. Batum, Caucasus.

N.A.S. GEO

Smirnov, V.A.

USSR.

6.3-312 551.584.31:551.588.2

Smirnov, V. A., Osobennosti mikroklimata razlichno orientirovannykh sklonov po nab-
lyudeniyam v Gul'ripshi (Abkhazia) zimoi 1934–1935 g. [Microclimatic peculiarities of differently oriented slopes according to observations made at Gul'ripshi (Abkhazia) during the winter 1934–1935.] (In: Leningrad, Agrogidrometeorologicheskii Institut, Materialy po agroklimaticheskomu raionirovaniiu subtropikov SSSR. [Materials on the agro-climatic classification of the subtropics in the U.S.S.R.] Leningrad, Gidrometizdat., 1938. 2:51–57, 2 figs., 5 tables.) DLC—Microclimatic observations were carried out during Jan.–March 1935 in the Sukhum region in order to find the different slopes. Detailed description of instruments, method used and places of observation are presented. Results given in tables and graphs. Conclusions outline the essential differences. The greatest differences in air temperature are found in the air layer closest to the surface; they reached 10°C. The lapse rate is much greater on the southern slope; it reached 8° in the first meter above the surface. The differences in air temperature between the western and eastern slope are small during the day time and great in the morning and evening hours, reaching 2°–5° at the ground surface. No differences in humidity were found in the layer of 25–150 cm. The surface layer is greatly affected by the condition of soil (its moisture and temperature) and therefore great variations were observed. The highest soil temperatures at a depth of 0.05 m were observed on southern slopes and the lowest on northern ones, the difference reached 15°C at time of the maximum temperature. Soil temperatures on western and eastern slopes are very different at evening and in the morning, but are almost equal in the day time hours. *Subject Headings:* 1. Microclimatology 2. Meteorological elements 3. Topographic effects 4. Subtropic zone, U.S.S.R. —*N.A.S.*

SMIRNOV, V.A.

Simplification of meteorological observations. Meteor.i gidrol. no.5:31-35 My '53. (MLRA 8:9)

1. Vsesoyuznyy institut rasteniyevodstva, Leningrad.
(Meteorology--Observations)

ZUYEV, V.A.

Simplification of Meteorological Observations Meteorol. i gidrologiya, No. 5, 1953, pp 35-38

The author proposes the observations of temperature at agricultural meteorological stations with an accuracy up to whole-number degrees, the use of the Selyaninov meteorological stall and of the rain gauge with receiving surfaces 200 and 100 square centimeters without shield, and the shortening of the times of observations to three (at intervals of 7, 13, 22 hours) and to two or one in the winter. (RZhGeol, No 5, 1954)

SO: Sum. No. 568, 6 Jul 55

SMIRNOV, V.A. (Reviewer)

"Collective-farm agrometeorological station." I.I.Giavoronskii, I.M.Petunin. Reviewed by V.A.Smirnov. Izv.Vses.geog.ob-va 86 no.1:108-109 Ja-F '54. (MLRA 7:2)

(Gaivoronskii, I.I.) (Petunin, I.M.)

(Meteorology, Agricultural)

Smirnov, V.

AID P - 1994

Subject : USSR/Aeronautics

Card 1/1 Pub. 135 - 18/20

Author : Smirnov, V., Lt. Col. of the Tech. Serv.

Title : A modern textbook on aviation meteorology is needed

Periodical : Vest. voz. flota, 5, 92, My 1955

Abstract : This is a letter to the editor in which the author complains that the textbook in present use, Aviation Meteorology, by Babikov, M. A., 1951, is not adequate. Due to the enormous progress of present-day all-weather flying, a new textbook should be issued.

Institution: None

Submitted : No date

SMIRNOV, V.A.

Aboveground meteorological observations in determining moisture reserves in the soil and moisture discharge in an irrigated spring wheatfield. Trudy GGI no.48:61-65 '55. (MLRA 9:7)

1.Vsesoyuznyy institut rasteniyevodstva.
(Soil moisture)

SMIRNOV, V.A., kand.tekhn.nauk.

Investigating the performance of stowing machines with curved belts. Trudy TSNIIMF no.11:22-43 '57. (MIRA 11:2)
(Cargo handling)
(Mechanical movements)

SMIRNOV, V.A., kand.tekhn.nauk.

Precise method of determining the power of a belt conveyer drive.
Trudy TSNIIMF no.11:44-54 '57. (MIRA 11:2)
(Conveying machinery--Electric driving)
(Cargo handling)

SOV/122-58-6-25/37

AUTHORS: Shil'krut, D.I., Docent, Rukin, V.V., Smirnov, V.A. and Butenko, G.A., Engineers

TITLE: A Mechanical Vibrator with Independent Adjustment of Amplitude and Frequency (Mekhanicheskiy vibrator s nezavisimoy regulirovkoy amplitudy i chastoty)

PERIODICAL: Vestnik Mashinostroyeniya, 1958, Nr 6, pp 63-64 (USSR)

ABSTRACT: An experimental vibrating saw designed and tested at the vibration-cutting laboratory of the L'vovskiy lesotekhnicheskiy institut (L'vov Lumbering Technology Institute) is described with the help of a cross-sectional drawing. A single shaft rotates in bearings inside a sleeve, itself rotating in two plummer blocks. The central shaft carries the cutting disc saw at one end and is driven by a V-belt pulley at the other end. The rotating sleeve is driven by another V-belt pulley. Due to its eccentric position, this rotation produces oscillations at a frequency independent of the speed of the cutting spindle. The rotating sleeve is mounted inside a set of double

Card 1/2

SOV/122-58-6-25/37

A Mechanical Vibrator with Independent Adjustment of Amplitude and Frequency

eccentrics. The maximum frequency of vibrations is 14 000 cpm. A simple device is diagrammatically illustrated which absorts the vibrations in one plane and transmits those at right angles.
There are 3 figures and 2 Soviet references.

Card 2/2

1. Cutting tools--Design 2. Cutting tools--Performance
3. Vibration--Applications

SMIRNOV, V.A., kand.tekhn.nauk

Theory of spiral vibratory hoists. Trudy TSNIIMF no.21:45-56 '58. (MIRA 12:8)

(Hoisting machinery)

SMIRNOV, V.A., kand.tekhn.nauk

Investigating the structural systems of kinematic joints and establishing the possible number of mechanisms. Trudy TSNIIMF no.21:57-64 '58. (MIRA 12:8)
(Universal joints (Mechanics))

SMIRNOV, V.A.

Device for sorting instrument parts according to their thickness (experience of optical-mechanical plant). Opt.-mekh.prom. [25] no.3:54 Mr '58. (MIRA 11:9)

(Sorting devices)

SMIRNOV, V.A., kand.fiz.-mat.nauk; KREYNIN, Ye.V.

Percolation method of connecting bore holes by means of high pressure air fracturing of coal seams. Podzem.gaz.ugl. no.4: 24-28 '57. (MIRA 11:1)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut Podzemgaz.
(Coal gasification, Underground)

SMIRNOV, V.A., kand.fiz.-mat.nauk

Shifting of the solid fuel fire-face. Podzem.gaz.ugl. no.1:12-15 '58.
(MIRA 11:4)
1. Vsesoyuznyy nauchno-issledovatel'skiy i proyektnyy institut podzemnoy gazifikatsii ugley.
(Coal gasification, Underground) (Combustion, Theory of)

AUTHOR: Smirnov, V. A. (Moscow). 24-1-12/26

TITLE: On simulating on models of the processes of combustion and gasification of solid fuel. (O modelirovanii protsessov goreniya i gazifikatsii tverdogo topliva).

PERIODICAL: Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh Nauk, 1958, No.1, pp.95-99 (USSR).

ABSTRACT: The methods of analogy in the fields of physico-chemical transformations are developed and applied primarily for steady state processes with known reaction mechanisms which take place in the kinetic region as, for instance, synthesis of ammonia and oxidation of sulphurous gas described by D'yakonov, G. K. (Ref.2). The conceptions on the diffusion zones of chemical reactions, expressed by Frank-Kamenetskiy, D.A.(Ref.3) and Zel'dovich, Ya. B. (Ref.4), as well as zones in which the chemical reactions proceed much faster than the processes of transfer of the reacting substances, proved particularly useful for a number of problems of chemical physics. In the work described in this paper it is assumed that the processes of combustion and gasification of solid fuel take place in the diffusion range; it is found thereby that for the diffusion range

Card 1/6

On simulating on models of the processes of combustion and gasification of solid fuel.

the criteria of analogy of the basic phenomena are coincident and it is, therefore, possible to simulate on models the combustion process and to verify experimentally the initial assumption of the diffusion mechanism of reactions. The non-steady state process of combustion or gasification is fully determined for a given shape and dimensions of the apparatus and a given initial distribution of a fuel with given initial properties and a given rate and composition of blast. Therefore, the process will be determined by the initial parameters of the apparatus, of the fuel, the blast and time. The author considers the problem of analogy of processes inside diffusion zones, i.e. when the speed of chemical reactions are much higher than the speed of feeding in and exchange of reacting substances. Under such conditions the laws of progress of chemical reactions are not decisive and for ensuring analogy it is enough that the physical phenomena of the process should be similar. There are seventeen independent parameters, five units of measurement which yield twelve dimensionless combinations, Eqs.(A) and (B), p.96. From these, three

Card 2/6 relations are derived which have to be taken into

On simulating on models of the processes of combustion and gasification of solid fuel.

consideration for establishing similarity between the model and the phenomena to be simulated, Eqs.(3), p.97. It follows from these that if the processes of combustion and gasification of a solid fuel are characterised by the diffusion reaction mechanism, the temperature and the composition of the gas components in the respective models of various scales should be equal at equal instants of time. This assumption was subjected to experimental verification. The main experiments were carried out for the following two schemes of the combustion process: gasification of a cylindrical canal inside a cylindrical coal body; gasification of a rectangular canal, one wall of which consists of coal (Fig.1). In the first variant crushed coal was mixed with 10% gypsum, whilst in the second variant natural coal blocks were used. In the first variant the experiments were made with oxygen blasts at the scales k = 1, 2, 4 whereby the combustion impulse was produced from the side where the blast was fed in; the rate of blast and the duration of the experiments in models of various scales were chosen in accordance with Eq.(1),

Card 3/6 p.96, and the results are entered in the graph, Fig.2,p.97.

On simulating on models of the processes of combustion and gasification of solid fuel.

In the second variant air blast was used, the scale being k = 1, 7.5 and 15 with model lengths of 15, 2 and 1 m; the thickness of the coal was 0.45 m on a 15 m model, the duration of the experiment was sixty hours on the 15 m model and 16 minutes on the 1 m model. The composition of the gas and its temperature were measured at three points along the length of the model and the results of these measurements are entered in Fig.3,p.98. It is concluded from these and other experiments that the similarity of non-steady state processes of combustion and gasification of solid fuel is conserved only if all the conditions of similarity formulated in the paper are observed. Two characteristic values of the reaction speed exist, namely, the kinetic reaction speed v which depends on the temperature in accordance with the Arrenius law; the diffusion reaction speed u, representing the speed of feeding in one of the reagents to the solid surface or to the region which contains the other reagent. The reaction speed will be equal to the smaller of the two speeds; if $u < v$ the process will proceed in the diffusion range, if $v < u$ the process will proceed in the kinetic range. From

Card 4/6

On simulating on models of the processes of combustion and gasification of solid fuel.

the conditions of similarity formulated in the paper, the speed u will increase with the square of the scale k in the diffusion range, i.e. $u < v$. With increasing scale of modelling the speed u will increase and when it becomes equal to v the process changes into the kinetic range, i.e. it attenuates. Thus, for each process of combustion and gasification there is a limit scale of modelling at which the process becomes impossible. The given proof is based solely on the heat balance of the process and, therefore, proof of instability of the process of combustion or gasification in the kinetic range is not a proof that the process proceeds entirely in the diffusion range; any reaction can proceed in the kinetic range as a result of the heat obtained from other reactions. This proof confirms that the reaction determining the thermal regime of the process takes place in the diffusion range and that the fraction of the product obtained as a result of reactions in the kinetic range is negligibly small in the processes of combustion and gasification of solid fuel. The model experiments described in this paper

24-1-12/26

On simulating on models of the processes of combustion and gasification of solid fuel.

were effected under the guidance of the author by A. A. Kasatkina, F. V. Kreynin and Z. L. Shik in the VNIIPodzemgaz between 1953 and 1956.
There are 4 figures and 5 references - 4 Russian, 1 German.

SUBMITTED: June 8, 1957.

ASSOCIATION: VNIIPODZEMGAZ.

AVAILABLE: Library of Congress.

Card 6/6

SMIRNOV, V.A. (Leningrad)

Investigating the height of capillary rise in loess soils. Osn., fund.i mekh.grun. 2 no.3:12-13 '60. (MIRA 13:7)
(Water, Underground) (Loess)

SMIRNOV, V.A., kand. tekhn. nauk

Method for calculating design gas consumption. Ispol'. gaza v nar. khoz. no.2:103-111 '63.

Coincidence coefficient and design safety of gas-supply systems. Ispol'. gaza v nar. khoz. no.2:112-119 '63.

Basis for determining the pressure stage number and inlet depth of high- and mean-pressure systems. Ibid.:120-125 (MIRA 18:9)

1. Laboratoriya tekhniko-ekonomicheskikh izyskaniy Saratovskogo gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta po ispol'zovaniyu gaza v narodnom khozyaystve.

SMIRNOV, V.A., kand. tekhn. nauk; ADSKAYA, I.N., inzh.; BAGRAMYAN, L.A., inzh.; CHERKASOVA, A.Ya., inzh.

Optimum distribution of differential pressure in 1-p annular systems. Ispol'. gaza v nar. khoz. no.2:133-138 '63. (MIRA 18:9)

1. Laboratoriya tekhniko-ekonomicheskikh izyskaniy Saratovskogo gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta po ispol'zovaniyu gaza v narodnom khozyaystve.

SMIRNOV, V.A., kand. tekhn. nauk; ADSKAYA, I.N., inzh.

Method for calculating the optimum number of gas distribution stations. Ispol'. gaza v nar. khoz. no.2:139-145 '63.
(MIRA 18:9)

1. Laboratoriya tekhniko-ekonomicheskikh izyskaniy Saratovskogo gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta po ispol'zovaniyu gaza v narodnom khozyaystve.

[illegible]KOV, V.A., kand. tekhn. nauk, SHIMEL'FENIG, L.A., kand. tekhn. nauk

Practices in determining household gas consumption norms. Ispol'. gaza v nar. khoz. no.2:159-162 '63. (MIRA 18:9)

1. Laboratoriya tekhniko-ekonomicheskikh issledovaniy Gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta po ispol'zovaniyu gaza v narodnom khozyaystve.

[redacted]

[redacted] mining the efficiency of carbon gas consumption. Gaz. [redacted] v. 10 no.7:12-14 '65. (MIRA 18:8)

SMIRNOV, V.A.; NIKITIN, N.I.

Calculation of dead-end gas pipes. Gaz. prom. 4 no.11:31-34 '59. (MIRA 13:2)
(Gas distribution)

LOGINOV, V.S., kand. tekhn. nauk, otv. red.; NIKITENKO, P.A., inzh., zam. otv. red.; LEVIN, A.M., kand. tekhn. nauk, red.; NIKITIN, N.I., inzh., red.; SMIRNOV, V.A., kand. tekhn. nauk, red.; YAKOVLEV, G.A., inzh., red.

[Construction and development of the production of household gas appliances] Konstruirovanie i razvitie proizvodstva bytovoi gazovoi apparatury. Saratov, Saratovskii in-t "GIPRONIIGAZ," 1960. 177 p. (MIRA 15:7)

1. Nauchno-tekhnicheskoye soveshchaniye po voprosu "Puti konstruirovaniya i razvitiya proizvodstva bytovoy gazovoy apparatury," Saratov, 1958. 2. Saratovskiy gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut po ispol'zovaniyu gaza v narodnom khozyaystve (for Nikitin).
(Gas appliances)

LEVIN, A.M., kand.tekhn.nauk; SMIRNOV, V.A., kand.tekhn.nauk

Hydraulic design of integrated low-pressure grid systems.
Stroi. truboprovod. 6 no.8:15-18 Ag '61. (MIRA 14:8)

1. Institut Giproniigaz, Saratov.
(Gas distribution)

SMIRNOV, V.A.; ADSKAYA, I.N.; BAGRAMYAN, L.A.

Calculation of the gas consumption levels in planning urban gas supply systems. Gaz. prom. 6 no.9:29-33 '61. (MIRA 14:12)
(Gas distribution)

LEVIN, A.M.; SMIRNOV, V.A.; CHERKASOVA, A.Ya.; KUVSHINOVA, V.I.

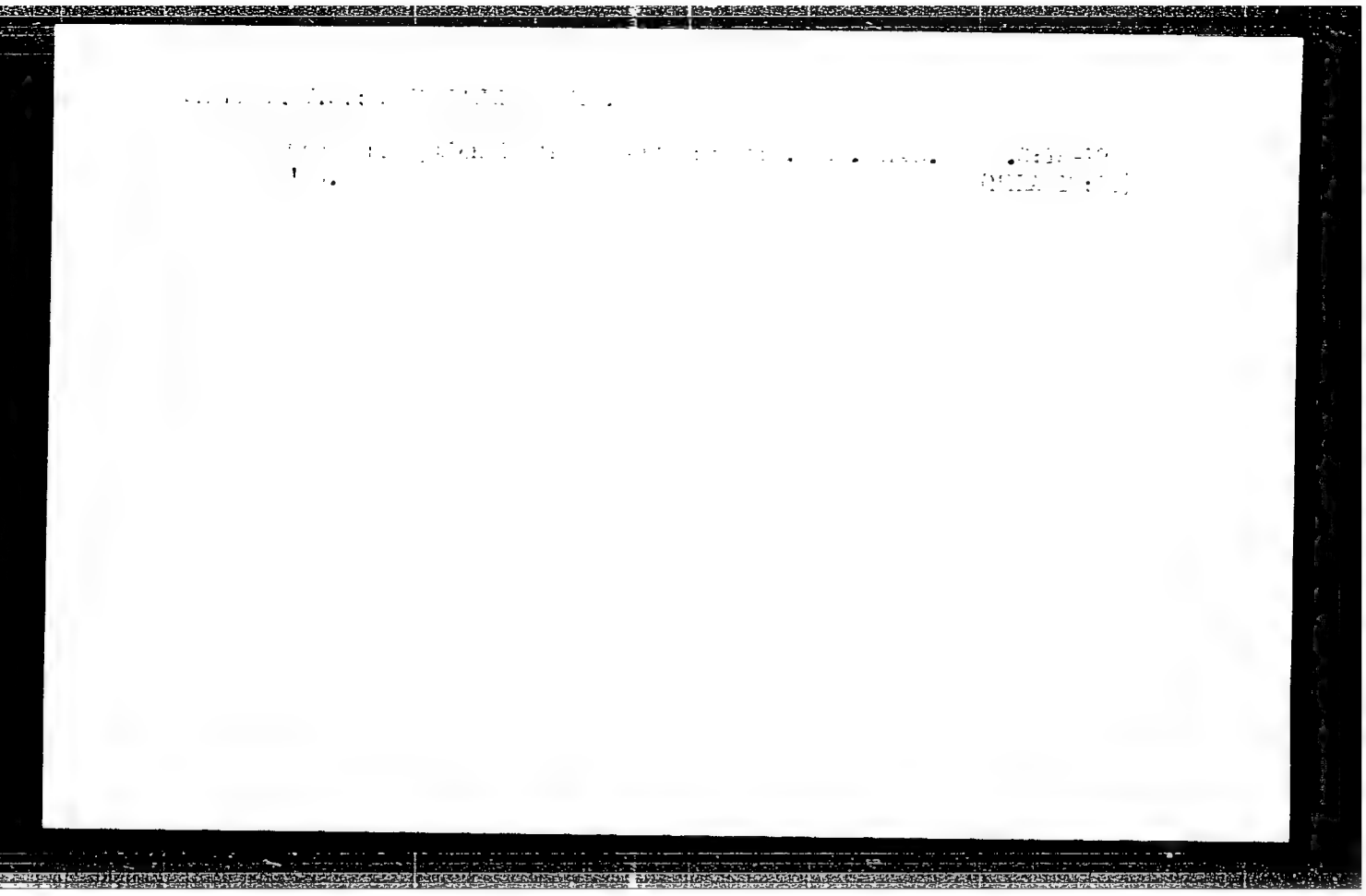
Using electronic computers for calculating multicircular urban gas systems. Gaz. prom. 6 no.11:33-34 '61. (MIRA 15:1)
(Gas distribution) (Electronic calculating machines)

SMIRNOV, V.A.; VIDGOP, L.N.; LEYMAN, P.P.; NIKITIN, V.A.

Certain contradictions in the planning of gas supply systems.
Gaz. prom. 7 no.12:23-26 '62 (MIRA 17:7)

SMIRNOV, V.A.

Method for determining rated gas consumption. Gaz. prom. 8 no.6:18-21 '63. (MIRA 17:8)



SMIRNOV, V. A.; ROZENFEL'D, V. M.; LYAKHOVA, R. P.

Efficiency in the full utilization of optimal pressure drop in city gas metworks. Gaz. delo no. 11:30-34 '63. (MIRA 17:)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut po ispol'zovaniyu gaza v narodnom khozyaystve.

SMIRNOV, V.A.; GERCHIKOV, S.V.

Using the electrohydraulic analogy method to calculate city gas works. Gaz. prom. 8 no.11:20-24 '63. (MIRA 17:11)

GERSHIKOV, S.V.; SHILOV, V.A.

Using electric models for the technical and economic calculation of city gas networks. Gaz. delo no.12:23-28 '63. (MIRA 17:10)

1. Saratovskiy gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut po ispol'zovaniyu gaza v narodnom khozyaystve.

SMIRNOV, V.A.; KUPRIYANOV, M.S.; CHERKASOVA, A.Ya.; OKULOVA, G.V.

Designing city gas systems according to optimal criteria with the use of electronic digital computers. Stroi. truboprov. 9 no.1:22-25 Ja '64. (MIRA 17:3)

1. Saratovskiy gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut po ispol'zovaniyu gaza v narodnom khozyaystve.

SMIRNOV, V.A.; GOLIK, V.G.

Selecting the optimal [illegible] for gas pipeline offtakes.
Gaz. delo no.2:18-23 '64. (MIRA 17:6)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut po ispol'zovaniyu gaza v narodnom khozyaystve.

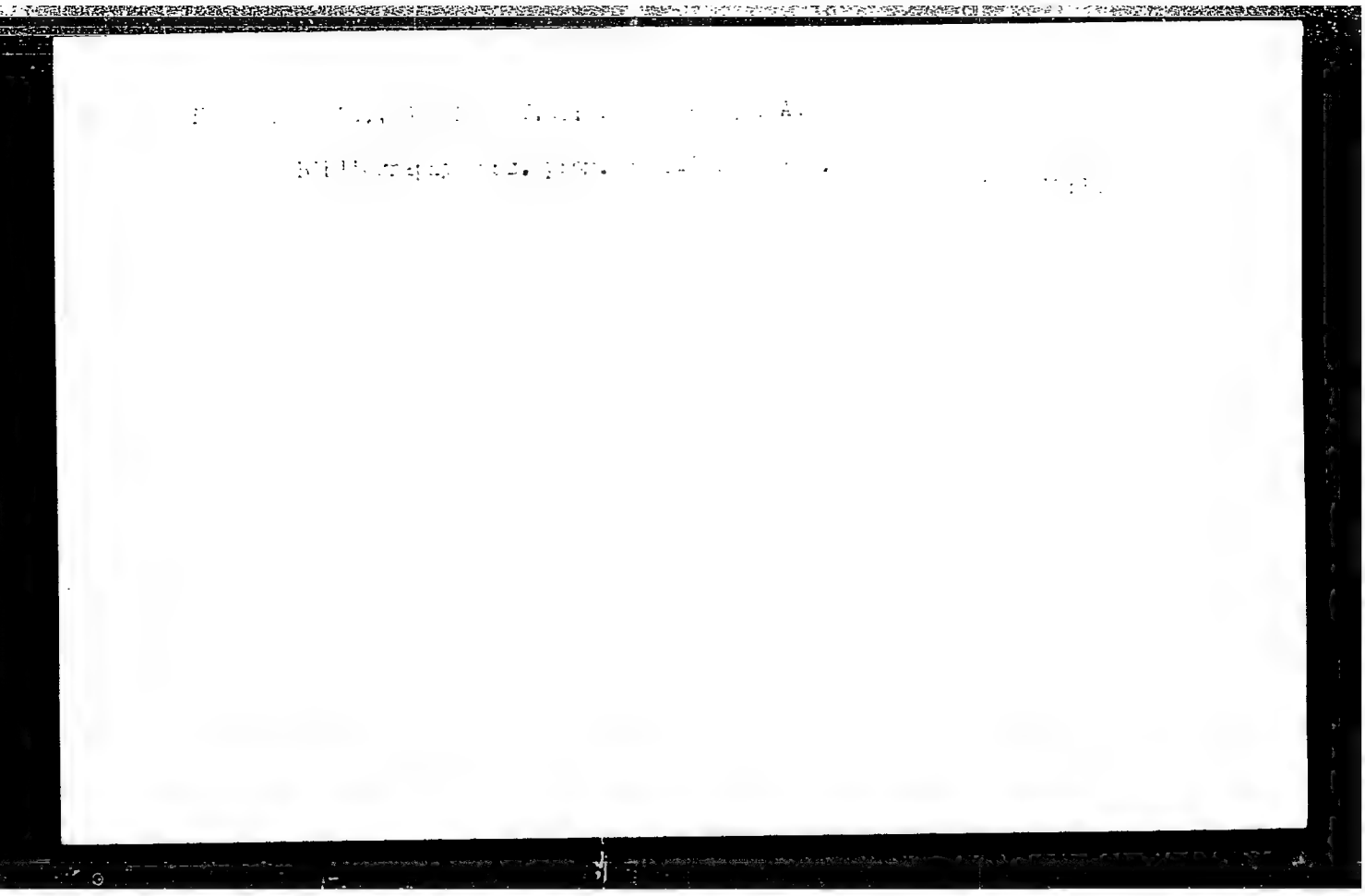
[redacted]

[redacted] gas supply regimes in the evaluation of the efficiency of [redacted] gas consumption. Gaz. delo no.12:20-22 '64.
(MIRA 18:2)

1. [redacted] gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut po ispol'zovaniyu gaza v narodnom khozyaystve.

[illegible], V.A.; [illegible], B.V.

Calculated regime of the parallel operation of certain gas distribution points for the overall load. Izv. vys. ucheb. zav.; neft' i gaz 7 no.6:22-27 '64. (MIRA 17:10)



SMIRNOV, V.A., kand. tekhn. nauk; RODIONOV, O.G., inzh.

Determining the optimum consumption of pipes for the gas systems of residential buildings. Ispol'. gaza v nar. khoz. no.2: 146-154 '63. (MIRA 18:9)

1. Laboratoriya tekhniko-ekonomicheskikh izyskaniy Saratovskogo gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta po ispol'zovaniyu gaza v narodnom khozyaystve.

L 51424-65 EWT(1)/EWP(m)/EWA(d)/FCS(k)/EWA(1) Pd-1
ACCESSION NR: AP5011326 UR/0258/65/005/002/0344/0345
533.6.011

10
B

AUTHOR: Smirnov, V. A. (Moscow)

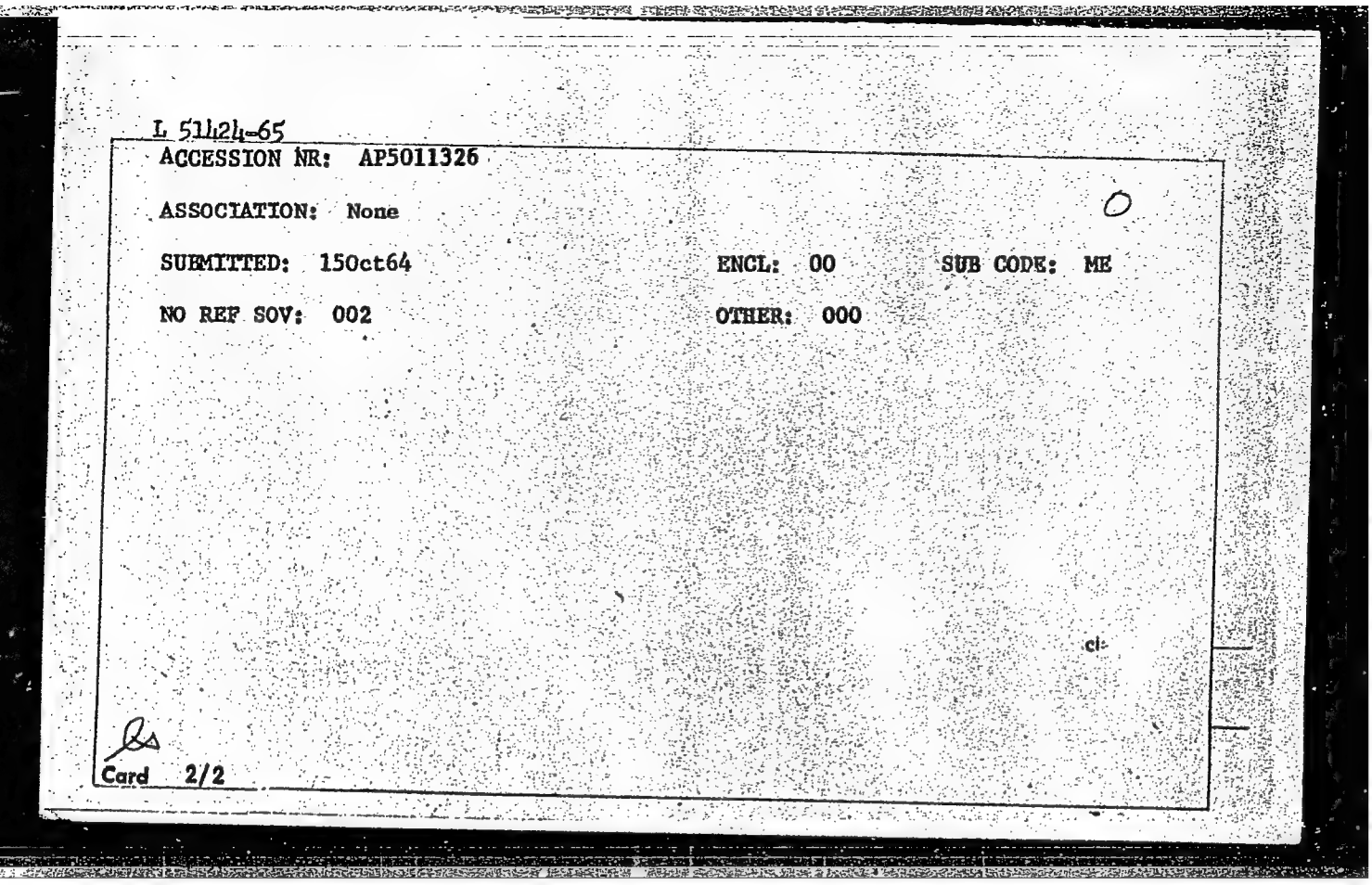
TITLE: Density gap flows with velocity proportional to distance from the center of symmetry

SOURCE: Inzhenernyy zhurnal, v. 5, no. 2, 1965, 344-345

TOPIC TAGS: gas volume expansion, two-layered volume, density gap flow, Sedov flow

ABSTRACT: The problem concerns the unidimensional expansion of a two-layered volume in a void. Discontinuity between layers is in density only, and the velocity of sound is assumed much higher in the inside layer. It is concluded that expansion of the inside layer depends solely on the dispersal of the outside layer. For the latter, the author considers flows identified by L.I. Sedov (velocity proportional to coordinate) and finds that the trajectory of any given particle in such flows can be accepted as a boundary limiting an internal gas volume in which the velocity of sound remains infinitely high for the entire considered period of motion. Orig. art. has: 10 formulas.

Card 1/2



L 51424-65

ACCESSION NR: AP5011326

ASSOCIATION: None

SUBMITTED: 15Oct64 ENCL: 00 SUB CODE: ME

NO REF SOV: 002 OTHER: 000

Card 2/2

SMIRNOV, V.A.; ADSKAYA, I.N.; BAGRAMYAN, L.A.; GOLIK, V.G.

Technical and economic indices of municipal distribution of liquefied petroleum gases. Gaz.prom. 10 no.11:30-33 '65. (MIRA 19:1)

L 17836-66 EWP(m)/EWT(1)/EWA(d)/EWA(1)
ACC NR: AP6004077 SOURCE CODE: UR/0040/65/029/005/0952/0958

AUTHOR: Smirnov, V. A. (Moscow)

ORG: none

63
B

TITLE: Flow of a uniformly expanding layer and separation of gaseous volume in a vacuum

SOURCE: Prikladnaya matematika i mekhanika, v. 29, no. 5, 1965, 952-958

TOPIC TAGS: gas dynamics, gas flow, similarity theory, diverging flow, plane flow, cylindric flow, flow velocity, isothermal flow

ABSTRACT: The expansion of a gas stream in a vacuum is investigated. The stream is assumed to be inviscid and with a kinetic energy higher than the internal energy. The analysis is concentrated at investigating the expansion of a uniform thin layer into vacuum for both the plane and cylindrical cases. For the plane case the velocity gradient is given by

$$\frac{\partial u}{\partial x} = \frac{u_0}{l + u_0 t} = \frac{1}{t + \omega}, \qquad \omega = \frac{l}{u_0}$$

and for the cylindrical case, by

$$\frac{x_1}{u_1} = \frac{x_2}{u_2} = \frac{x_2 - x_1}{u_2 - u_1} = \omega$$

Card 1/3

2

Card 2/3

L 17836-66
ACC NR: AP6004077

layer from potential to kinetic as it expands in vacuum. Orig. art. has: 38 equations and 4 figures.

SUB CODE: 20/ SUBM DATE: 01Dec64/ ORIG REF: 006/ OTH REF: 001

Card 3/3 nst

ACC NR: AT6036934 SOURCE CODE: UR/0000/66/000/000/0116/0122

AUTHORS: Smirnov, V. A.; Kalliga, G. P.

ORG: none

TITLE: Determining the permeability to gas of pure oxide materials at high temperatures

SOURCE: Nauchno-tekhnicheskoye obshchestvo chernoy metallurgii. Moskovskoye pravleniye. Vysokoogneupornyye materialy (Highly refractory materials). Moscow, Izd-vo Metallurgiya. 1966, 116-122

TOPIC TAGS: refractory material, gas diffusion, aluminum oxide, magnesium oxide, zirconium oxide

ABSTRACT: An installation was constructed for the determination of gas permeability of ceramic materials at high temperatures. The construction of the installation was based on the work of G. M. Fryer, D. W. Budworth, and J. P. Roberts (Trans. Brit. Ceram. Soc., 1963, No. 6, 62, 525--536). A schematic of the installation is presented. With the aid of the installation, the gas permeability of MgO, Al_2O_3, and ZrO_2 in the temperature range from 0 to 2000C was determined. The experimental results are presented in graphs and tables (see Fig. 1). The gas permeability C_T

Card 1/3

for low values of permeability was calculated with the aid of the expression

$$G = \frac{Q \cdot h}{P \cdot F \cdot \tau},$$

where Q is the amount of the gas diffused through the walls of the pipe specimen in time τ, P - the working pressure in the furnace, h - wall thickness of specimen, F - surface area of heated pipe. Q was calculated by means of

$$Q = \frac{\Delta P \cdot V}{760},$$

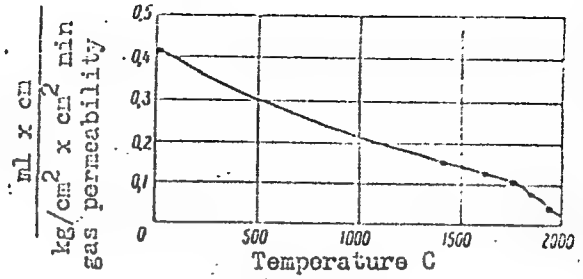
where Δ P is the pressure change in the system during time τ, and V is the volume of the isolated system. For large values of the gas permeability, the latter was calculated by means of the expression

$$G = \frac{V \cdot h}{P \cdot \tau \cdot F} 2{,}3 \lg \frac{P_2}{P_1},$$

where P_1 and P_2 are the initial and final pressures in the isolated system, respectively. It was found that the gas permeability of sintered MgO and Al_2O_3 increased sharply with increase in temperature, but that of incompletely sintered ZrO_2 decreased with increase in temperature.

ACC NR: AT6033931

Fig. 1. Change of gas permeability of ZrO_2 specimen with increase in temperature



Orig. art. has: 1 table, 5 graphs, and 3 equations.

SUB CODE: 11/ SUBM DATE: 02Nov65/ ORIG REF: 001/ OTH REF: 004

Card 3/3

ACC NR: AP7003858 SOURCE CODE: UR/0191/67/000/001/0061/0064

AUTHOR: Smirnov, V. A.

ORG: none

TITLE: Microstructure of fiberglass after high temperature heating of one side

SOURCE: Plasticheskiye massy, no. 1, 1967, 61-64

TOPIC TAGS: fiberglass, heat resistant material, high temperature material, ~~metallographic examination~~, PYROLYSIS

ABSTRACT: A microstructural analysis was done on fiberglass which was heated on one side to 300, 500, 700, and 1000°C. Sheet samples of AG-4S fiberglass (120 × 20 mm in area, and 3.5 and 8 mm in thickness) were heated in an IMASh-11 apparatus at rates ranging from 2 to 15°C/sec. The temperature distribution in the samples was measured with high response chromel-alumel thermocouples. After heating, the samples were packed into a block by cementing with epoxy and cut at 45° to the filament axis. The structure was outlined by etching in concentrated nitric acid for 10-15 min. Microstructures were shown of samples heated to 700°C at 2, 10, and 15°C/sec. The experiments indicated that a critical temperature existed for each heating rate whereby the structure changed due to pyrolysis of the binding matrix. During pyrolysis the surface charred and layers adjacent to the surface decomposed, giving off gases which

UDC: 678.5.06-419.8:677.521]:536.42

Card 1/2

COUNTRY : USSR
CATEGORY : Cultivated Plants. Cereals.

ABS. JOUR. : RZhBiol., No 23, 1958, No. 104622

AUTHOR : Malyugin, Ye. A., Shakhnovich, A. V., Smirnov, V. A.
INST. : Academy of Sciences USSR
TITLE : Moisture Consumption and the Microclimate of Spring Wheat in the Conditions of Irrigation.

ORIG. PUB. : V sb.: Biol. osnovy oroshayem. zemled. M., AN SSSR, 1957, 385-389

ABSTRACT : An irrigated field (studies at the All-Union Institute of Plant Growing) differs from a non-irrigated one in its phyto- and local climates. Microclimate depends also on the conditions of irrigation, and the meteorological factors of a field are reflected in the amount of transpiration in wheat and in the evaporation from the surface of the field. A. M. Alpat'yev found by empirical method a formula for the aggregate expenditure of moisture by the agricultural crops being irrigated. In checking this formula, the factual and computed values proved to be identical. Correction for microclimate of the aggregate expenditure of

Card: 1/2

SMIRNOV, V. A., Candidate of Agric Sci (diss) -- "The agroclimatic conditions of cultivating post-harvest crops in connection with their location in the European part of the USSR". Leningrad, 1959. (All-Union Order of Lenin Acad Agric Sci im V. I. Lenin, All-Union Inst of Plant Growing) (KL, No 21, 1959, 118)

SMIRNOV, Vladimir Aleksandrovich; PROTOPOPOV, V.S., red.; FLAUM, M.Ya., tekhn.red.; PRAVDINA, M.I., tekhn.red.

[Stubble crops and climate] Pozhnivnye kul'tury i klimat. Leningrad, Gidrometeor.izd-vo, 1960. 95 p. (MIRA 14:4)

(Crops and climate)